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STATEWIDE INVENTORY OF AIR POLLUTANT EMISSIONS, STATE OF KANSAS 1970 (REVISED)

Timothy W. Devitt

PEDCo-ENVIRONMENTAL

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The results of the emissions inventory for the State of Kansas are presented. The purposes of the study were: (1) to calculate the emissions of air pollutants from point and area sources in the State of Kansas; (2) to assemble the emission data in a suitable format for use in developing the Implementation Plan. The emissions inventory included the following pollutants: particulates, sulfur oxides, nitrogen oxides, carbon monoxide, and hydrocarbons.

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1.0 INTRODUCTION

This report presents the results of the air pollutant emissions inventory of the State of Kansas. The purposes of the study were:

1. To calculate the 1970 quantity of air pollutants emitted from point and area sources in the State of Kansas.
2. To assemble the emission data in a suitable format for use in developing the Implementation Plan.

The five pollutants included in the emissions inventory are particulates, sulfur dioxide, nitrogen dioxide, carbon monoxide, and hydrocarbons.

Point source emission estimates, with the exception of those for Wyandotte County, were prepared by the Air Quality and Occupational Health Section of the Environmental Health Division, Kansas State Department of Health. Emissions from point sources in Wyandotte County were calculated by the Kansas City, Kansas, Wyandotte County Department of Health, Division of Air Pollution Control. PEDCo-Environmental Specialists, Inc. calculated the area source emissions and assembled the area and point source emission data in the required implementation plan format.

2.0 AREA DESCRIPTION

The seven Kansas Air Quality Control Regions and the counties in each Region are shown in Figure 1.1. The AQCR region codes are in parentheses. The political jurisdiction codes, which are used to identify individual counties within each AQCR, are listed in Table 2.1.

Sedgwick and Shawnee Counties and the Kansas portion of the Kansas City Interstate AQCR were divided into grids of 6.5, 25 and 100 square kilometers. Maps of these grid systems are in Section 4.5, Area Maps.

Northwest Kansas Intrastate Air Quality Control Region (097)

North Central Kansas Intrastate Air Quality Control Region (096)

Northeast Kansas Intrastate Air Quality Control Region (095)

Metropolitan Kansas City Interstate Air Quality (094)

Southwest Kansas Intrastate Air Quality Control Region (100)

South Central Kansas Intrastate Air Quality Control Region (099)

Southeast Kansas Intrastate Air Quality Control Region (098)

Figure 1.1 State of Kansas Air Quality Control Regions

Reproduced from best available copy.

TABLE 2.1 - POLITICAL JURISDICTIONS WITHIN THE KANSAS AIR QUALITY CONTROL REGIONS

Region No. 094 - Metropolitan Kansas City Interstate Air Quality Control Region

1. Johnson County
2. Leavenworth County
3. Wyandotte County

Region No. 095 - Northeast Kansas Intrastate Air Quality Control Region

1. Atchinson County
2. Brown County
3. Doniphan County
4. Douglas County
5. Franklin County
6. Jackson County
7. Jefferson County
8. Marshall County
9. Miami County
10. Nemaha County
11. Osage County
12. Pottawatomie County
13. Shawnee County
14. Wabaunsee County

Region No. 096 - North Central Kansas Intrastate Air Quality Control Region

1. Clay County
2. Cloud County
3. Dickinson County
4. Ellsworth County
5. Geary County
6. Jewell County
7. Lincoln County
8. McPherson County
9. Mitchell County
10. Morris County
11. Ottawa County
12. Republic County
13. Rice County
14. Riley County
15. Saline County
16. Washington County

Region No. 097 - Northwest Kansas Intrastate Air Quality Control Region

1. Barton County
2. Cheyenne County
3. Decatur County
4. Ellis County
5. Gove County
6. Graham County
7. Logan County
8. Ness County
9. Norton County
10. Osborne County
11. Phillips County
12. Rawlins County
13. Rooks County
14. Rush County
15. Russell County
16. Sheridan County
17. Sherman County
18. Smith County
19. Thomas County
20. Trego County
21. Wallace County

Region No. 098 - Southeast Kansas Intrastate Air Quality Control Region

1. Allen County
2. Anderson County
3. Bourbon County
4. Chautauqua County
5. Cherokee County
6. Coffey County
7. Crawford County
8. Elk County
9. Greenwood County
10. Labette County
11. Linn County
12. Lyon County
13. Montgomery County
14. Neosho County
15. Wilson County
16. Woodson County

Region No. 099 - South Central Kansas Intrastate Air Quality Control Region

1. Butler County
2. Chase County
3. Cowley County
4. Harper County
5. Harvey County
6. Kingman County
7. Marion County
8. Reno County
9. Sedgwick County
10. Sumner County

Region No. 100 - Southwest Kansas Intrastate Air Quality Control Region

1. Barber County
2. Clark County
3. Comanche County
4. Edwards County
5. Finney County
6. Ford County
7. Grant County
8. Gray County
9. Greeley County
10. Hamilton County
11. Haskell County
12. Hodgeman County
13. Kearney County
14. Kiowa County
15. Lane County
16. Meade County
17. Morton County
18. Pawnee County
19. Pratt County
20. Scott County
21. Seward County
22. Stafford County
23. Stanton County
24. Stevens County
25. Wichita County

3.0 EMISSIONS ESTIMATING PROCEDURES

This section reviews the procedures used to estimate emissions and, in the case of area source emissions, apportion the emissions to the appropriate counties. Methods of apportioning emissions to the "gridded areas" are discussed in Section 4.0.

The emission factors used to calculate emissions resulting from fuel combustion are listed in Appendix A.

3.1 Point Sources

For purposes of this study, a point source was defined as any source which emits ten tons per year or more of any single pollutant. In addition, most, if not all, of the processes defined in Appendix C of the Federal Register, April 9, 1971, were included as point sources irrespective of the quantity of pollutants emitted.

The point sources were identified in a previous survey conducted by the Kansas State Agency. As part of that survey, approximately 4,000 questionnaires were mailed to potential sources. About 1,500 questionnaires were returned. Follow-up contacts by area representatives of the State Agency insured that all potential point sources were considered. Additional contacts were made by the State Agency as part of this emissions inventory to update the emission estimates and obtain point source fuel usage data.

Emissions were calculated by applying emission factors to the fuel quantities, refuse quantities, and production rates obtained by questionnaires and plant visits. The extent of control on each point source was also determined by questionnaire or plant visit.

Emissions from all point sources are listed in the computer printout. In most cases, such information as stack parameter values, process weights, coordinates and operating schedules are missing. However, the State Agency, as part of its overall enforcement program, is establishing a reporting schedule for specific firms and will obtain this information. A copy of the general questionnaire which all sources on a reporting schedule will complete and an example of the forms tailored for specific industries are included in Appendix B.

A summary tabulation of the point and area source emissions in each AQCR is presented in Section 5.0 of this report.

3.2 Area Sources - Fuel Combustion

Fuel usage data determined in a previous Office of Air Program's survey and by the Wyandotte County Department of Health were used for the Kansas portion of the Kansas City

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3.2 Area Sources - Fuel Combustion

Fuel usage data determined in a previous Office of Air Program's survey and by the Wyandotte County Department of Health were used for the Kansas portion of the Kansas City

Interstate AQCR. These fuel totals were subtracted from State totals to yield the fuel quantities to be apportioned to the other six AQCR's.

The fuel consumption categories used in the emissions inventory were residential, commercial-institutional, and industrial. This section outlines the procedures used for determining the quantity of fuel in each category and the method of apportioning this quantity to the individual counties.

Where specific data were not available, the following values were used for the fuel parameters:

Bituminous Coal	
% Ash	11.3
% Sulfur	4.4
Distillate Oil	
% Sulfur	.27
Residual Oil	
% Sulfur	1.2
Natural Gas	
% Sulfur	.0001

3.2.1 Residential Fuel

A. Coal

Data: ° 1960 Census of Housing - Kansas;

° Statistical Abstracts of the U.S., 1969;

° U.S. Bureau of Mines, Distribution of Pennsylvania Anthracite for Coal Year April 1, 1967, to March 31, 1968.

° Air Pollutant Emission Inventory Techniques, Unpublished Report, E.P.A., OAP, Bierbaum, P.G. and Gedgaudas, M.J.

Procedure: Since the fuel use data in the 1970 Census of Housing were not available, the 1960 census data were used. Residential coal usage for each county, with the exception of those counties in the Kansas portion of the Kansas City AQCR, was calculated using the number of degree-days in Wichita -- assumed representative of the State, the total number of dwelling units using coal for space heating in each county, and a factor of .0012 tons of coal burned per dwelling unit-degree day. To account for the reduction in the number of units which use coal for space heating and to place residential coal usage in reasonable proportion to the commercial-institutional and industrial usage, the calculated amount was reduced by 35%. It was assumed that the coal is all bituminous since only 1,296 tons of anthracite are reported to have been shipped to Kansas.

For the Kansas City AQCR, the estimates of residential coal usage made by the OAP were used.

B. Fuel Oil

Data: ° 1960 Census of Housing - Kansas;

° Statistical Abstracts of the U.S., 1969.

Procedure: The number of dwelling units in the six AQCR's which use fuel oil for "cooking fuel" and "water heating fuel" was multiplied by 250 gallons per year-dwelling

unit. To determine the quantity of fuel oil consumed for space heating, the number of dwelling units using fuel oil for space heating in the six AQCR's was multiplied by the number of degree-days in Wichita and the factor 0.18 gallons per dwelling unit-degree day. The six AQCR residential fuel oil total (i.e., cooking, water heating and space heating fuel) was apportioned to the individual counties using the ratio of the number of dwelling units which use fuel oil for space heating in a county to the six Region total of such dwelling units.

In the Kansas City AQCR, the OAP estimates of fuel oil consumption were used.

C. Natural Gas

Data: ° U.S. Bureau of Mines: 1969 Minerals Yearbook, Natural Gas Preprint;

° Department of Commerce, 1960 Census of Housing - Kansas.

Procedure: The quantity of natural gas delivered to Kansas consumers for residential use was obtained from the Minerals Yearbook. The amount of natural gas consumed for residential use in the Kansas portion of the Kansas City Interstate AQCR, determined in the OAP survey, was subtracted from this value. The difference was apportioned to each county outside the Kansas City AQCR using, as the apportioning

factor, the ratio of the number of dwelling units which use natural gas for space heating in each county to the total number of such units in the six other Regions.

3.2.2 Commercial-Institutional Fuel

A. Coal

Data:
- U.S. Bureau of Mines, Mr. L. Westerstrom, (703) 557-1350;
- U.S. Bureau of the Census, Census of Manufacturers: 1963. Fuels and Electric Energy Consumed in Manufacturing Industries: 1962.
- U.S. Department of Commerce, 1967 Census of Business-Wholesale Trade, Kansas;
- U.S. Department of Commerce, 1967 Census of Business-Retail Trade, Kansas;
- Kansas State Board of Agriculture, Population of Kansas by Counties - 1970.

Procedure: From the Bureau of Mines, it was determined that 374,000 tons of coal were shipped to Kansas and Nebraska during 1970 for "retail" and "all other" use. These categories include coal used for industrial, commercial-institutional and residential purposes, but do not include coal used by power plants. Based on the industrial coal distribution data in the Census of Manufacturers' report, it was assumed that 54% of the 374,000 tons was shipped to Kansas. The amount of commercial-institutional and industrial area source coal

was determined by subtracting the following from this amount: the point source industrial and commercial coal usage identified in the point source survey, the residential coal as calculated above, and the coal used in the Kansas portion of the Kansas City Interstate AQCR. This difference was divided equally between commercial-institutional and industrial area source coal usage for lack of any data on the actual distribution. Furthermore, since there were no reliable data available regarding fuel usage by individual counties, the commercial-institutional coal was apportioned to the counties using the following factor, per the example in the Emission Inventory Techniques document:

$$\text{County Apportioning Factor} = [1/3\ (\frac{A}{B}) + 1/3\ (\frac{C}{D}) + 1/3\ (\frac{E}{F})]$$

where:

A = number of retail establishments in a county
B = number of retail establishments in the six Regions
C = number of wholesale establishments in a county
D = number of wholesale establishments in the six Regions
E = county population
F = six Region population

B. Distillate Oil

Data: °U.S. Bureau of Mines, Sales of Fuel Oil and Kerosene in 1969;

°U.S. Department of Commerce, 1967 Census of Business-Wholesale Trade, Kansas;

°U.S. Department of Commerce, 1967 Census of Business-Retail Trade, Kansas;

- Kansas State Board of Agriculture, Population of Kansas by Counties - 1970.

Procedure: The quantities of "kerosene" and "distillate-type heating oils" sold in Kansas were obtained from the U.S. Bureau of Mines report. Distillate fuel oil used domestically in the Kansas portion of the Kansas City AQCR, and the amount used by commercial-institutional point sources throughout Kansas were subtracted from the total to yield the quantity of area source commercial-institutional fuel. This difference was apportioned to individual counties using the factors developed for commercial-institutional coal apportionment.

C. Residual Oil

Data:
- U.S. Bureau of Mines, Sales of Fuel Oil and Kerosene in 1969;
- U.S. Department of Commerce, 1967 Census of Business-Wholesale Trade, Kansas;
- U.S. Department of Commerce, 1967 Census of Business-Retail Trade, Kansas;
- Kansas State Board of Agriculture, Population of Kansas by Counties - 1970.

Procedure: The quantity of oil listed in the Bureau of Mines report as "Residual-type Heating Oils" and "Residual-type Fuel Oil for use by the Military" were considered to be used solely for commercial-institutional fuel combustion. The amount of commercial-institutional residual oil identified

in the point source survey, and that used in the Kansas City AQCR for commercial-institutional purposes, was subtracted from this total. The difference was apportioned to each county using the factors developed for commercial-institutional coal apportionment.

In the Kansas City AQCR, the quantity of fuel identified in the OAP survey was used to estimate emissions.

D. Natural Gas

Data:
- U.S. Bureau of Mines: 1969 Minerals Yearbook, Natural Gas;
- U.S. Department of Commerce, 1967 Census of Business-Wholesale Trade, Kansas;
- U.S. Department of Commerce, 1967 Census of Business-Retail Trade, Kansas;
- Kansas State Board of Agriculture, Population of Kansas by Counties - 1970;
- Annual Reports by Natural Gas Companies; Kansas State Corporation Commission, Topeka, Kansas.

Procedure: Natural gas sales data by county and user category, namely residential, commercial, and industrial, were obtained from the Kansas State Corporation Commission for the following companies:

- Arkansas - Louisiana Gas Company
- Central Kansas Power Company
- The Gas Service Company
- Greeley Gas Company
- Kansas-Nebraska Natural Gas Company
- Northern Natural Gas Company
- The Tri City Gas Company
- Union Gas System Inc.

The residential and commercial gas sales by these companies accounted for approximately 85% of the residential and commercial sales reported in the Bureau of Mines Yearbook. However, the Kansas Corporation Commission data did not include some of the smaller companies and did not distinguish between residential and commercial natural gas sales for all companies. The Bureau of Mines' numbers were considered to be more complete and thus were used. Further, since some of the counties were not included in the Kansas Corporation Commission listing, the commercial and institutional natural gas was apportioned using the same factors as developed for coal. The quantity of natural gas apportioned was the difference between (1) the sum of the "commercial" and "other consumer" figures in the Bureau of Mines Yearbook, and (2) the amount of natural gas consumed by commercial/institutional establishments in the Kansas portion of the Kansas City AQCR plus the amount identified in the point source survey as consumed by commercial and institutional point sources throughout the state.

In the Kansas City AQCR, the quantity of natural gas identified in the earlier OAP survey was used to estimate emissions.

3.2.3 Industrial Fuel

A. Coal

Data:
- U.S. Bureau of Mines, Mr. L. Westerstrom, (703) 557-1350;
- U.S. Bureau of the Census, Census of Manufacturers: 1963. Fuels and Electric Energy Consumed in Manufacturing Industries: 1962.
- U.S. Department of Commerce, 1967 Census of Manufacturers, Kansas.

Procedure: The method of determining the quantity of area source coal was described in Section 3.2.2A. Area source coal was apportioned to the individual counties using the ratio of the number of manufacturing employees in a county to the six Region total of such employees as the apportioning factor. In the Kansas City AQCR, the coal usage estimates prepared by the earlier OAP survey were used.

B. Distillate Oil

Data:
- U.S. Bureau of Mines, Sales of Fuel Oil and Kerosene in 1969;
- U.S. Department of Commerce, 1967 Census of Manufacturers, Kansas.

Procedure: The quantities of distillate oil listed in the Bureau of Mines report as "industrial use", "oil company use" and "miscellaneous uses" were categorized as industrial fuel oil. The quantities of distillate identified in the point source survey and in the Kansas portion of the Kansas City AQCR were subtracted from this total. The difference was apportioned to the individual counties using the factors developed for industrial coal apportionment.

C. Residual Oil

Data:
- U.S. Bureau of Mines, Sales of Fuel Oil and Kerosene in 1969;
- U.S. Department of Commerce, 1967 Census of Manufacturers, Kansas.

Procedure: The quantity of residual oil for industrial use was obtained from the Bureau of Mines report under the same usage type classifications listed for distillate oil. The quantities of industrial residual oil identified in the point source survey and in the Kansas City AQCR were subtracted from this total. The difference was apportioned using the same factors developed for industrial coal apportionment.

D. Natural Gas

Data:
- U.S. Bureau of Mines: 1969 Minerals Yearbook, Natural Gas;
- U.S. Department of Commerce, 1967 Census of Manufacturers, Kansas.

Procedure: From the Bureau of Mines Yearbook, natural gas usage figures were obtained for the following industrial categories:

- "industrial use"
- "lease and plant fuel"
- "pipeline fuel".

In addition, the difference between the Bureau of Mines total for power plant fuel use and the quantity identified in the point source survey as used by power plants, was added to the above three natural gas figures. This was done simply to include this gas in the emissions inventory.

From this total, the industrial point source natural gas and the natural gas used in the Kansas portion of the Kansas City AQCR were subtracted to determine the six Region total of area source industrial gas. This quantity was apportioned using the factors developed for industrial distillate oil apportionment. In the Kansas City AQCR, the industrial gas usage figures identified in the previous OAP survey were used.

3.3 Area Sources - General

3.3.1 Solid Waste Disposal

Data:
- 1968 National Survey of Community Solid Waste Management Practices, EPA. Cincinnati, Ohio;
- Acreage of Rangeland Intentionally Burned, Cooperative Extension Service, R.M. Hyde, Kansas State University.

Procedure: The quantity of refuse generated in each county was calculated using different solid waste generation factors for rural and urban counties. All but Johnson, Sedgwick, Shawnee and Wyandotte counties were considered rural. The rural solid waste generation factor used was 5.5 pounds per capita day or one ton of refuse per capita per year. For the four urban counties a factor of two tons per capita per year was used.

From the National Survey data, the quantity of waste which was collected was determined as well as its method of disposal. Only those land disposal sites identified in the survey as practicing no open burning were considered sanitary landfills; both "uncontrolled" and "planned and limited" burning were treated as 100% open burning dumps.

The percent collected ranged from about 30 to 70 percent. It was assumed that 100% of the uncollected rural solid waste was open burned. The uncollected urban waste was assumed to be domestic, commercial and industrial waste handled on-site or at a private site. The ratio of manufacturing employees to population was used to approtion the uncollected amount of the urban refuse into two categories: waste which was burned in domestic incinerators and waste which was burned in commercial-industrial incinerators.

The open burning dumps identified in the National Survey were considered point sources and the regional emission totals are listed in Tables 5.1 through 5.7 under "Open Burning Dumps - Point Sources". Although some of the dumps in the Kansas portion of the Kansas City Interstate AQCR and other regions may have ceased open burning in either 1970 or 1971, their estimated 1970 emissions have been included.

The conical burners in Dodge City (Ford County) and Garden City (Finney County) are listed in the Section 5 tabulation as "Incineration - Point Sources". Emissions included in the "Incineration - Area Sources" are those resulting from domestic, commercial, and industrial incinerators located in the four urban counties.

The emissions listed in the category "Open Burning, On Site - Area Sources" are those from the open burning of the "uncollected" refuse in the rural counties.

Several counties also practice range-burning of agricultural wastes. The acreage burned in these counties was estimated by the Kansas State University Extension Service. Emissions were calculated using the agricultural open burning emission factors and assuming that an average of 700 pounds of material were burned per acre. Table 3.1 lists by region and county the acreage burned and the resulting emissions. The emissions are also summarized by Air Quality Control Region and listed under "Agricultural Burning" in Tables 5.1 through 5.7.

3.3.2 Motor Vehicles

Data:

- Number of Miles and Annual Average Daily Vehicle Miles of Travel on State Highways (including city connecting links), Local Federal-aid Secondary Highways, Local City Streets, and Local Rural Roads in Kansas by County for the Year Ending December 31, 1969. State Highway Commission of Kansas, Topeka, Kansas;
- Topeka and Wichita Functional Classification Maps: Traffic Count Data, State Highway Commission of Kansas.
- Final Draft-Cridded Motor Vehicle Emissions for Kansas City Air Quality Control Region. Prepared for the Environmental Protection Agency, Durham, North Carolina by PEDCo-Environmental Specialists under Contract No. 68-02-0044, Task Order No. 4, December 20, 1971.

Procedure: The total number of vehicular miles driven in each county was obtained from the Kansas Highway Commission. The data are listed by the following categories: State Highways, Local City Streets, Secondary Highways (rural and urban), and Local Rural Roads. The State highways category includes the Kansas Turnpike and city connecting links. It was assumed that all vehicle miles, except those for state highways, were driven at an average of 25 miles per hour. State highway travel was assumed to be at an average of 45 miles per hour. Emission factors based upon vehicle-miles driven at 25 MPH and 45 MPH were used to calculate the emissions in each county.

For Shawnee and Sedgwick Counties, traffic maps were used to estimate vehicular emissions in each grid using the traffic count method.

Motor vehicle emissions estimates for the Kansas portion of the Kansas City AQCR were obtained from the December 20, 1971 PEDCo report.

3.3.3 Motor Vehicles - Diesel

Data: ° Revenue from Sale of Diesel Fuel in Kansas, Department of Revenue, Motor Fuel Tax Division, Walter Dunn, Chief (913) 296-2411;

° Total Registration for 1968 by County, Kansas Motor Vehicle Department.

Procedure: The Department of Revenue collected $8,258,379 from a $0.08 per gallon tax on diesel fuel. The corresponding 103,230,000 gallons were apportioned to individual counties using the ratio of the number of trucks registered in a county to the state total of registered trucks.

3.3.4 Aircraft

Data: ° 1971 Airport Directory, Aircraft Owners and Pilots Association, Washington, D.C. 20014

Procedure: All airports in Kansas which had a control tower or at least a 3,500 foot paved runway were sent a questionnaire requesting 1970 data on the number of flight operations by type of aircraft. All but two of the twenty-two questionnaires were returned. In the several cases where there was insufficient information regarding the type of aircraft, the following assumptions were made to use the FAA flight classification data:

Type of Operation (1)	Type of Aircraft
Air Carrier	95% is jet powered. Three engine.
Military - Itinerant	80% jet, 20% piston. 65% two engine, 35% single engine.
Civil - Itinerant	80% piston, 20% jet. 65% single engine, 35% multi-engine.
Civil - Local	90% piston, 10% jet. 70% single engine, 30% multi-engine.
Military - Local	90% jet, 10% piston. 90% multi-engine, 10% single engine.

(1) FAA Classification

3.3.5 Vessels

Data: °Waterborne Commerce of the United States; Department of the Army Corps of Engineers, Part 2 (p. 13, 1969).

Procedure: A total of 2,807,000 tons of freight movement is listed for the section of the Missouri River between Kansas City, Kansas and Omaha, Nebraska. Using a factor of 1/100 of a gallon of diesel fuel per ton-mile of barge movement, it was determined that 28,000 gallons of diesel fuel were consumed per mile of river. The resulting emissions

were halved since it was assumed that half of the emissions would be in Missouri. Emissions were apportioned to each county, and grid where appropriate, on the basis of the length of continuous river front.

3.3.6 Railroad

Data:
- U.S. Bureau of Mines, Sales of Fuel Oil and Kerosene, 1969;
- U.S. Department of Commerce, City and County Data Book, 1962.

Procedure: The amount of fuel oil used by railroads in Kansas was obtained from the Bureau of Mines Report. The quantity of fuel used by railroads in the Kansas portion of the Kansas City AQCR (determined by multiplying the amount of railroad fuel used in the entire Interstate AQCR - identified in the previous OAP survey - by the ratio of track miles in the Kansas portion of the AQCR to the total track miles in the AQCR), was subtracted from the state value to determine the six Region totals.

This six Region quantity was apportioned to the counties in proportion to the ratio of the number of transportation employees in a county to the six Region total of such employees. The reasonableness of this apportionment was confirmed by inspection of the railroad map which indicated track mileage per county.

In Topeka and Wichita, railroad fuel usage was apportioned to the grids by assuming that 80% of the fuel was used equally in those grids with switching yards and the remaining 20% was used equally in those grids having railroad tracks but no switching operations.

Railroad emissions estimates developed in the previous OAP survey of the Kansas City AQCR were used for that region.

3.3.7 Evaporation Loss

Hydrocarbon emissions were calculated for fuel storage evaporation loss, gasoline marketing, dry cleaning, and paint and ink solvent loss. In the computer printout, the hydrocarbon emissions from all of these sources are listed by county under the category "solvent evaporation." In the region totals, Tables 5.1 through 5.7, fuel storage evaporation losses are listed under "Process Losses, Area Sources"; losses from gasoline marketing are listed under "Gasoline Handling"; and the dry cleaning, paint and ink solvent losses are listed under, "Miscellaneous-Area Source, Solvent."

A. Fuel Storage Evaporation Losses

Data: ° Petroleum Facts and Figures, 1967 Edition, page 160.

° Compilation of Air Pollution Emission Factors, Preliminary document, April 1971.

Procedure: Kansas has a total fuel storage capacity of 125,434,000 and 27,492,000 gallons of gasoline and kerosene respectively. The total kerosene capacity was multiplied by 135/238 to compensate for its lower volatility and the "corrected kerosene plus gasoline storage capacity of 140,829,000 gallons was used to calculate emissions. The emission factors used to calculate the breathing and working losses for fixed and floating roof tanks are listed below:

Hydrocarbon Emission Factors for Evaporation Losses from the Storage of Gasoline

Type of Tank	Emission Factor
° Fixed Roof Breathing Loss	0.4 lbs per day per thousand gallons of storage capacity
Working Loss	11 lbs per thousand gallons of throughput
° Floating Roof Breathing Loss	140 lbs per day per tank
Working Loss	Negligible

Breathing losses from fixed roof storage tanks were calculated by assuming that 75% of the total fuel storage capacity is of the fixed roof variety.

Working losses from fixed roof storage tanks were calculated by assuming that throughput is equal to 6 times the capacity, as suggested in the Emission Factors document.

Breathing losses for floating roof tanks were calculated assuming that an "average" tank has a 50 ft. diameter and a 35,000 gallon capacity.

The total fuel storage evaporation losses for the state are the sum of the above categories. These emissions were apportioned using the ratio of gasoline sales in a specific county to the state total.

B. Gasoline Marketing

Data:
- Annual Average Daily Vehicle Miles of Travel in Kansas by County Excluding Travel on Interstate Highways for the Year Ending December 31, 1969, and Percent of State Total, State Highway Commission of Kansas, Topeka, Kansas;
- Revenue from Sale of Gasoline in Kansas, Department of Revenue, Motor Fuel Tax Division, William Dunn, Chief (913) 296-2411.

Procedure: In 1970, Kansas received $82,298,000 from a $0.07 per gallon gasoline tax. This includes $8,440,000 eventually refunded because of "off-road use". The total amount of gasoline sold, 1,176 billion gallons, was apportioned to the counties using the percent of total state vehicle miles driven in each county as the apportioning factor. Evaporation losses from gasoline marketing were calculated using an emission factor of 21 pounds of hydrocarbons per thousand gallons of gasoline.

C. Dry Cleaning

Data: • 1970 Kansas Population by County, Kansas State Board of Agriculture.

Procedure: Dry cleaning solvent evaporation losses were determined by multiplying the total state population by the emission factor of 2.7 pounds per capita per year. Solvent losses for the state were apportioned to each county on the basis of population.

D. Paint Solvents

Data: • Chemicals, Petroleum, and Rubber and Plastics Products Manufacturing; U.S. Department of Commerce (April 1969).

Procedure: In 1966, the national value of shipments of paints and allied products totalled $2,710 million. The value of such shipments in Kansas was assumed to be equal to the state-to-nation ratio of capital expenditures for chemicals and allied products, namely 14.2/2515.8. Dollar apportionment to the counties was on the basis of manufacturing employees:

$$\frac{(14.2)}{(2515.8)} \times \frac{(2,710)}{(1)} \times \frac{\#\text{ of manufacturing employees (county)}}{\#\text{ of manufacturing employees (state)}}$$

= $ millions of dollars (county).

It was further determined that $1 million in paint sales is equivalent to 450 tons of solvent per year. This estimate was based upon:

- A price range of $4 to $7 per gallon.
- 10% to 60% solvent content.
- The fraction of the total sales for the particular type of paint or allied product considered.

Paint solvent emissions were calculated using the following formula:

$$\frac{(450)}{(1 \times 10^6)} \times \$ \text{ Millions Dollars (county)} = \text{Tons/Yr. Paint Solvent Emissions.}$$

E. Ink Solvent Emissions

Data: ° Chemicals, Petroleum, and Rubber and Plastics Products Manufacturing; U.S. Department of Commerce, (April 1969).

Procedure: Total ink sales in the U.S. amounted to $367 million. Ink usage was apportioned to the counties according to the following formula:

$$\frac{(14.2)}{(2515.8)} \times (367) \times \frac{\text{\# of manufacturing employees (county)}}{\text{\# of manufacturing employees (state)}} = \$ \text{ million ink (county).}$$

Ink solvent emission estimates were based on the assumptions that ink costs $0.30 per pound and has a 60% volatile content. The following formula was used:

$$\text{Ink Solvent Emissions (Tons/Yr.)} = \frac{(\$ \text{ Million Ink Sales, County}) \ (.6)}{(\$0.30/\text{lb.}) \quad (2{,}000 \text{ lb/ton})}$$

4.0 AREA GRIDDING

Grid systems were prepared for Sedgwick and Shawnee Counties using the Universal Transverse Mercator System. The established grid system for Leavenworth, Johnson, and Wyandotte Counties in the Kansas portion of the Kansas City Interstate AQCR was used.

All grid systems used 2.5, 5.0 and 10.0 square kilometer grids. The grid systems extended to the county lines.

4.1 Sedgwick County (Wichita)

The grid apportioning factors for Sedgwick County were based on the 1970 preliminary population estimates by census tract and on the data contained in the "1990 Land Use Projections and Preliminary Development Plan". This information was obtained from the Wichita-Sedgwick County Metropolitan Area Planning Department, Wichita, Kansas.

Residential fuel usage was apportioned to grids using the ratio of the population in that grid to the county population.

Commercial-institutional fuel usage was apportioned using the 1990 land use projection of commercial acreage

since the 1960 actual land use data were incomplete. The apportioning factor for each grid was the ratio of commercial acreage in that grid to the total commercial acreage in the county.

Industrial fuel was apportioned to each grid using the ratio of the 1990 projection of industrial acreage in that grid to the projected county total of industrial acreage.

Solvent evaporation emissions were apportioned to each grid using the ratio of the sum of the commercial-institutional and industrial acreage in a grid to the county total of such acreage.

Motor vehicular emissions were determined by the traffic count method for the 47 grids where traffic data were available. This procedure accounted for approximately 85% of the vehicle miles listed as driven in the county by the Kansas State Highway Commission. The remaining 15% was apportioned to the 24 outlying grids by inspection of maps indicating the miles of highway in each grid. Diesel motor vehicle fuel was apportioned using the same factors developed for gasoline apportionment (e.g., if 1% of the county total of gasoline powered vehicle miles were driven in a grid, it was assumed that 1% of the diesel vehicle miles were also driven in that grid).

4.2 Shawnee County (Topeka)

Apportioning data were obtained from the Topeka Area Planning Study - Statistics Report, prepared for the Topeka-Shawnee County Regional Planning Commission, Topeka, Kansas.

Residential and commercial-institutional fuel were apportioned to individual grids using the ratio of the 1968 population in that grid to the county population. Open burning and incineration were apportioned using the same factors. Industrial fuel was apportioned using the ratio of the number of employees in heavy and light industry in a grid to the county total of such employees. Solvent emissions were apportioned on the basis of the ratio of the number of "heavy and light industry employees" and "all other employees" in a grid to the county total of such employees.

Motor vehicle emissions were calculated using the traffic count method. Traffic data were available for 22 of the 31 grids. Approximately 80% of the vehicle miles, as listed by the Kansas Highway Commission, were accounted for by this method. The remaining 20% were apportioned to the outlying grids by inspection of roadmaps detailing highway mileage in each grid.

4.3 Leavenworth and Johnson Counties

The ratio of the population in each grid to the county population was used to apportion the following:

- domestic fuel usage
- commercial-institutional fuel usage
- open burning
- incineration
- solvent evaporation

Industrial fuel usage was apportioned by inspection of area maps. Motor vehicle emissions, both gasoline and diesel, were available from the December 20, 1971 PEDCo report (see Section 3.3.2). These are listed in the "print-out" as "hand-calculated" emissions. Also included under hand calculated emissions are fuel combustion emissions from railroad and barge operations.

4.4 Wyandotte County

Area source emissions in Wyandotte County were apportioned to the grids using the same apportioning factors as used in the previous OAP survey.

4.5 Area Maps

The following figures illustrate the grid systems and point source locations for Sedgwick and Shawnee Counties:

Figure 4.1 - UTM Grid System for Sedgwick County

Figure 4.2 - UTM Grid System for Shawnee County

Figure 4.3 - UTM Grid System for the Kansas Portion of the Kansas City Interstate AQCR

Figure 4.4 - Location of Point Sources in Sedgwick County

Figure 4.5 - Location of Point Sources in Shawnee County

Figure 4.6 - Location of Point Sources in the Kansas Portion of the Kansas City Interstate AQCR.

The source numbers on Figures 4.4 through 4.6 are the individual source numbers used in the computer listing. Tables 4.1 and 4.2 link the source number to the firm name for Figures 4.4 and 4.5 respectively. Because of a confidentiality clause in the enabling ordinance under which the Division of Air Pollution, Wyandotte County Department of Health operates, the names of individual point sources were not released for the majority of the sources in the Kansas portion of the Kansas City Interstate AQCR.

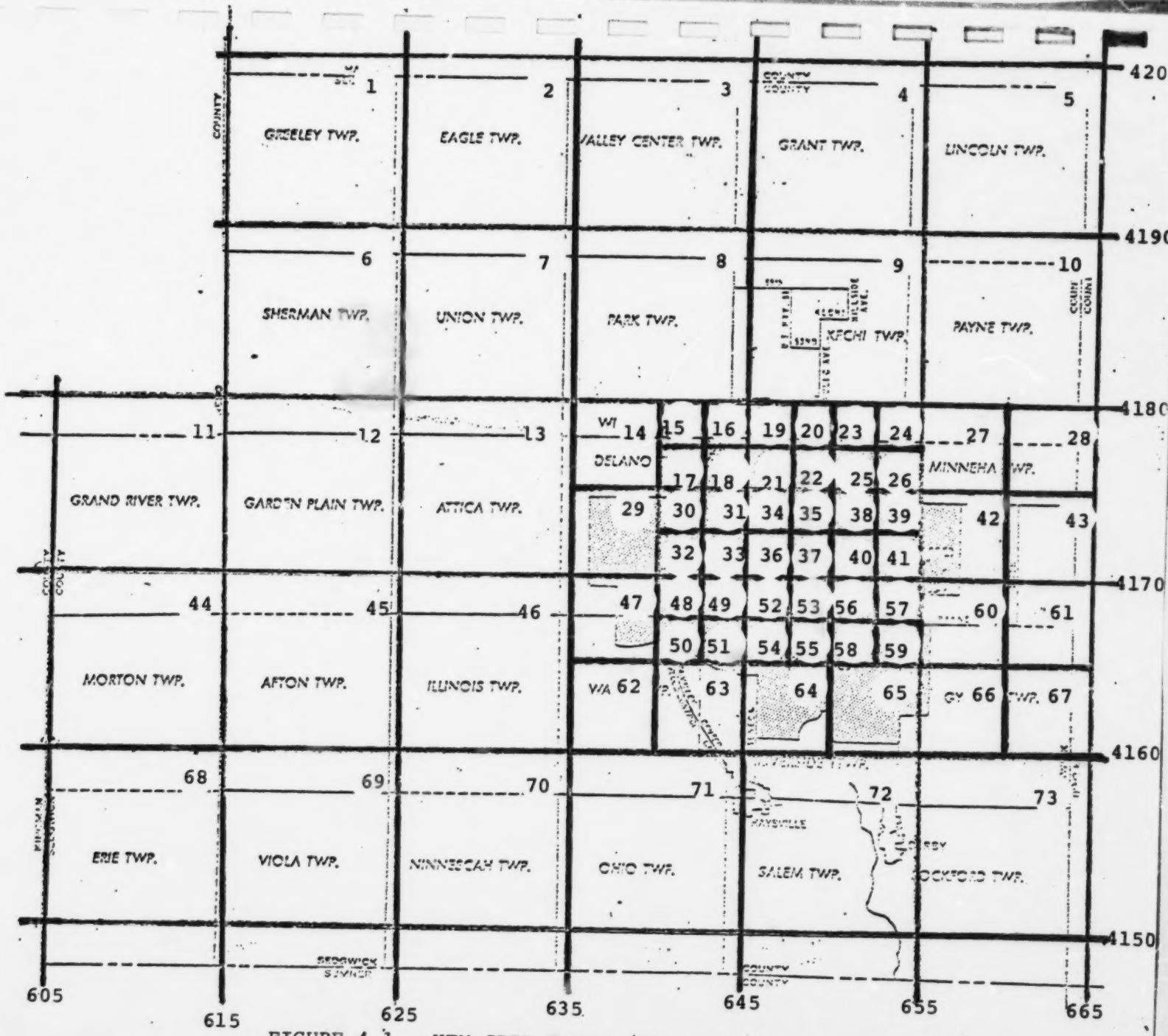


FIGURE 4.1 - UTM GRID SYSTEM FOR SEDGEWICK COUNTY

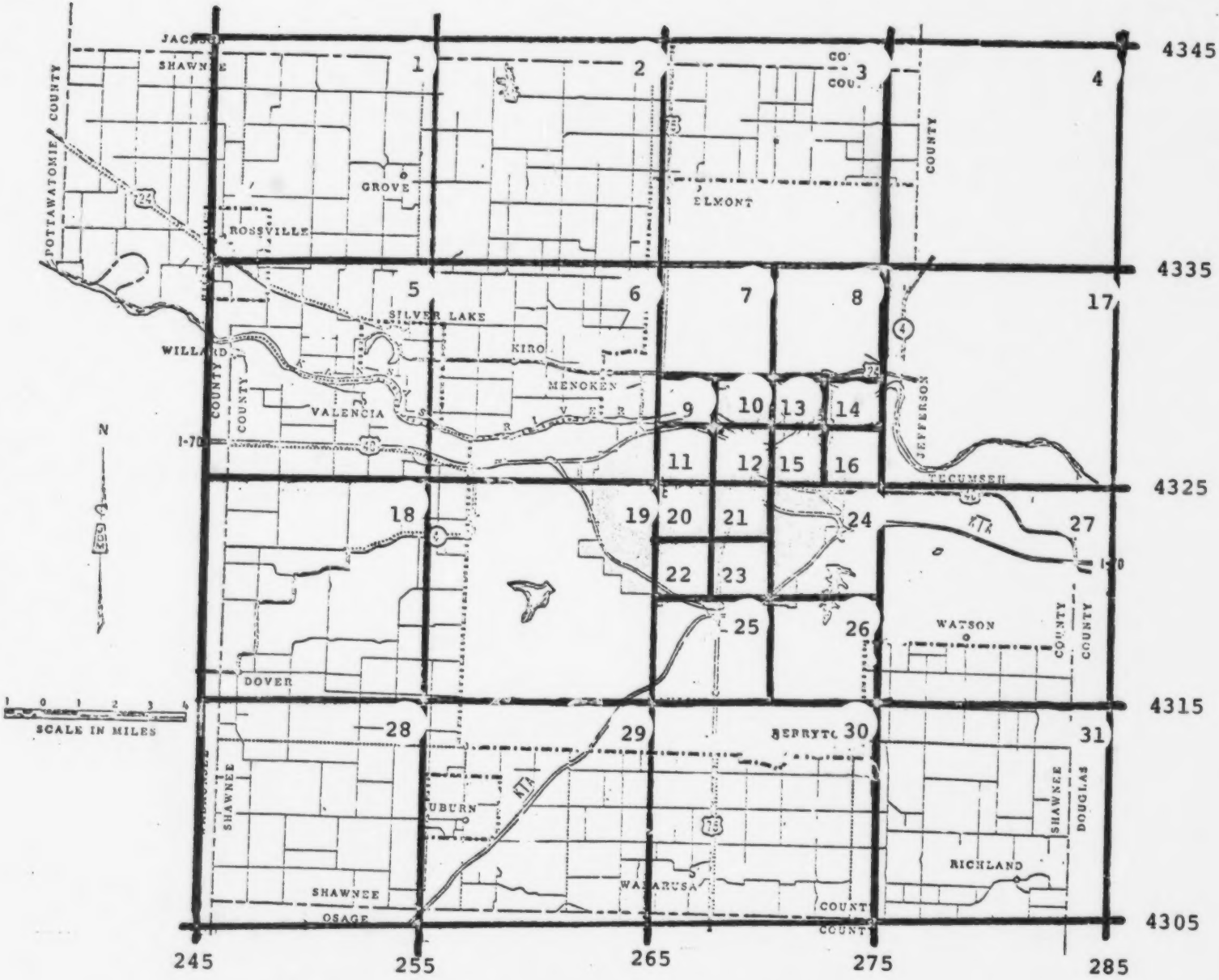


FIGURE 4.2 - UTM GRID SYSTEM FOR SHAWNEE COUNTY

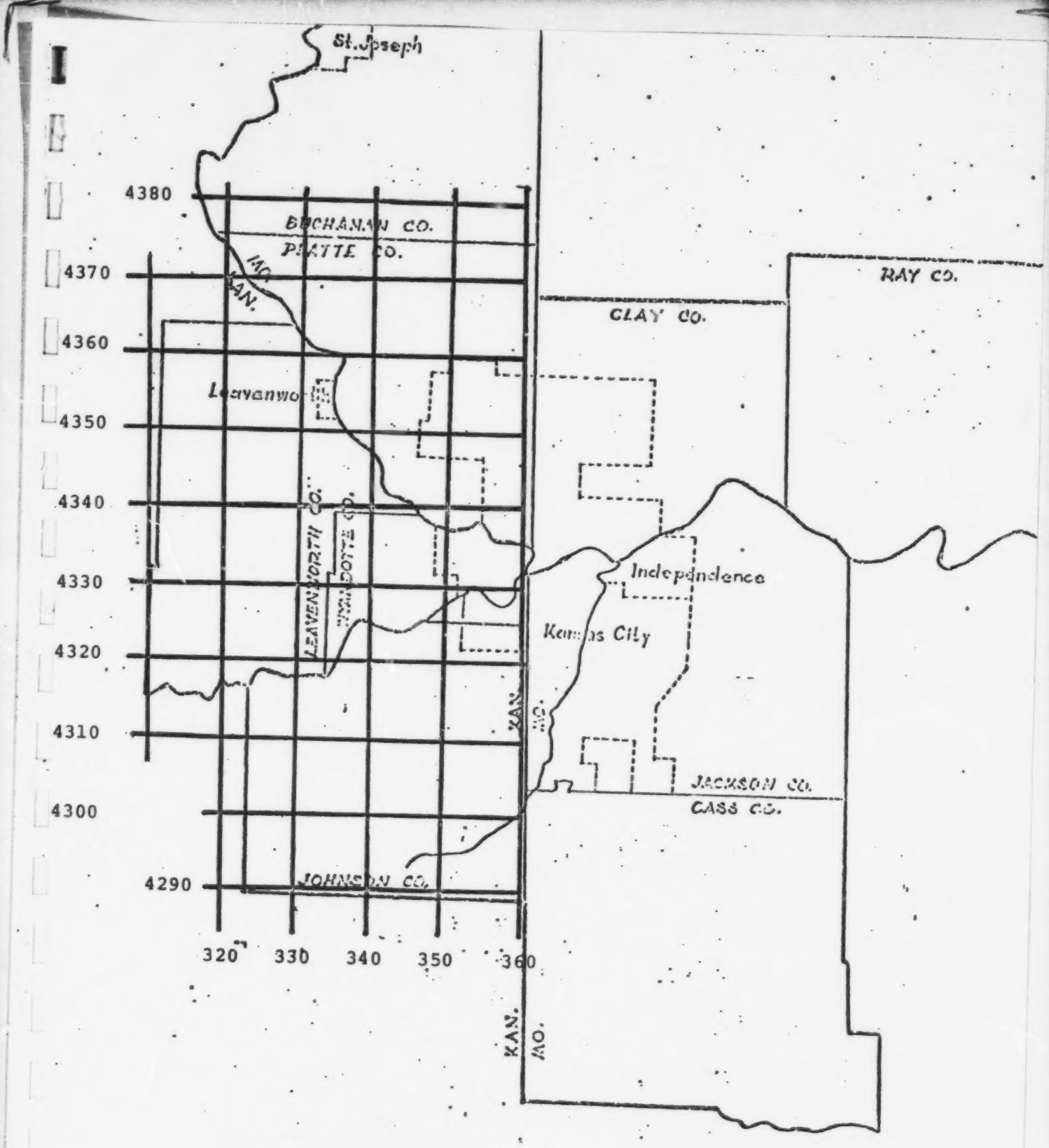
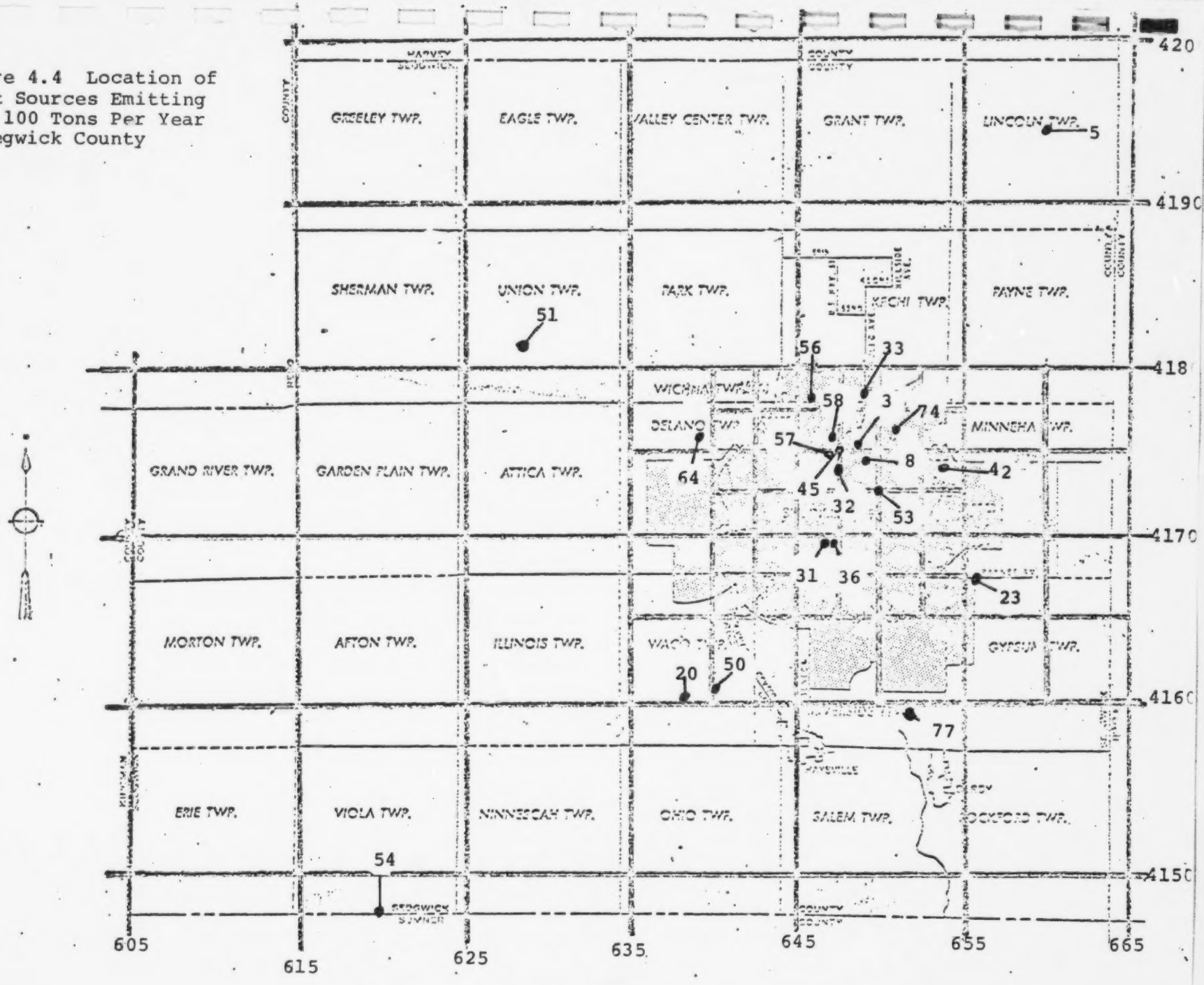


Figure 4.3 UTM Grid System for the Kansas Portion of the Kansas City Interstate AQCR.

Figure 4.4 Location of Point Sources Emitting Over 100 Tons Per Year in Segwick County



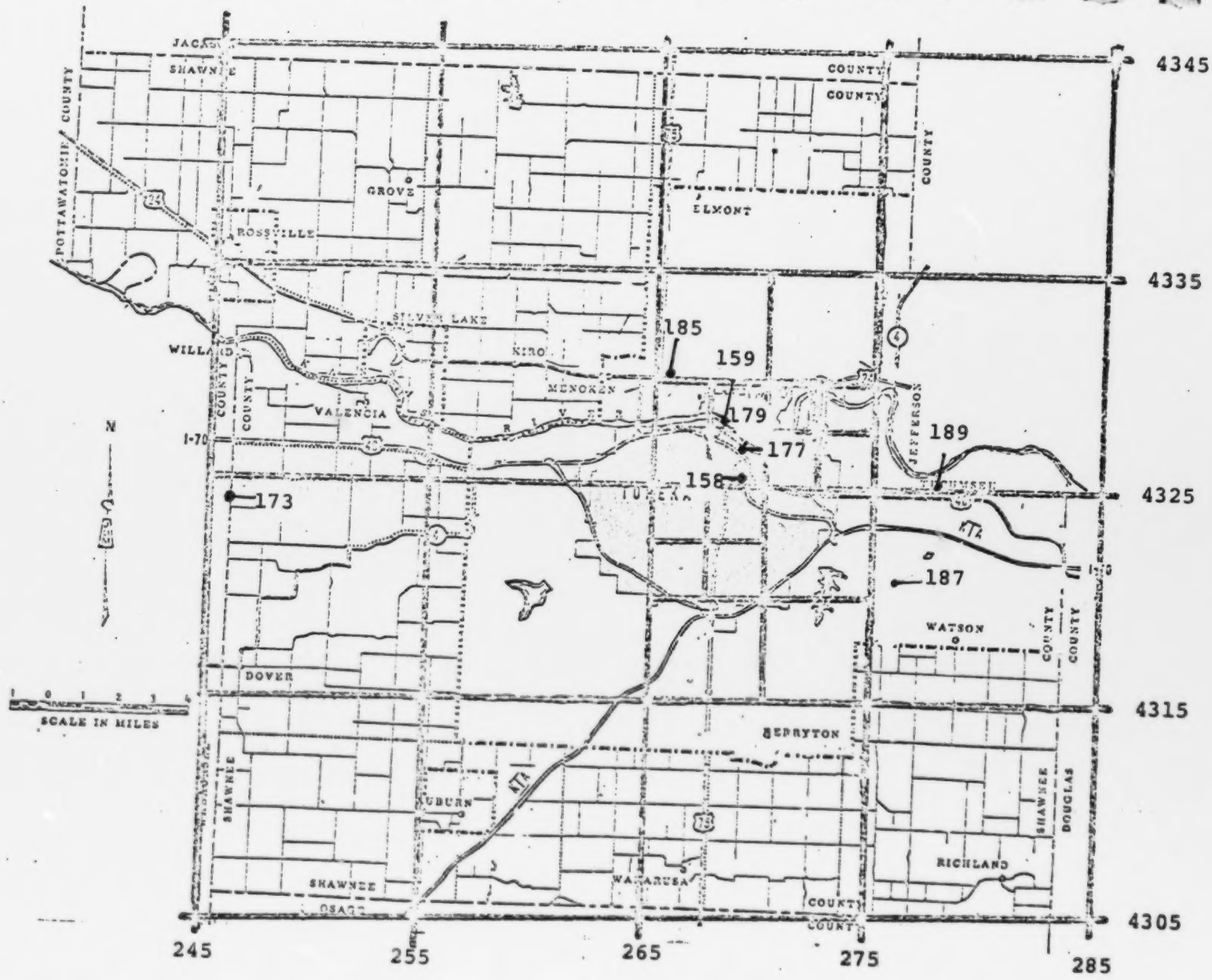


Figure 4.5 Location of Point Sources Emitting Over 100 Tons Per Year in Shawnee County.

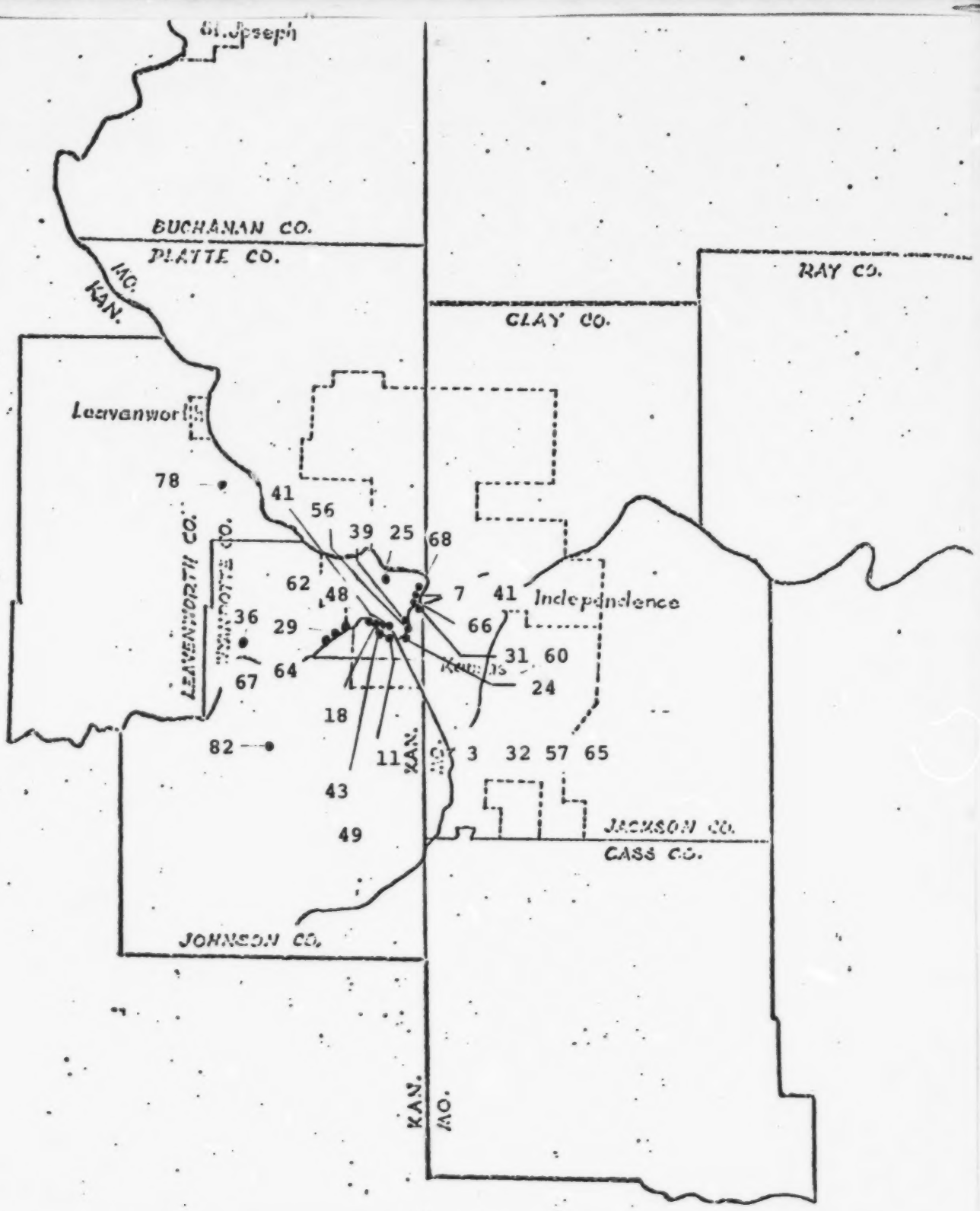


Figure 4.6 Location of Point Sources Emitting Over 100 Tons Per Year in the Kansas Portion of the Kansas City Interstate AQCR.

Table 4.1 POINT SOURCES IN SEDGWICK EMITTING 100 TONS PER YEAR OF MORE OF ANY POLLUTANT

Source #	Firm
3	Wichita Flour Mills
5	Furley Grain
8	Ross Industries
20	Vulcan Chemical Co.
23	McConnell Air Force Base
31	Grede Foundries
32	Service Iron Foundry
33	Ferrolay Foundry
36	Ehrsam Wichita Foundry
42	Standard Press Steel
45	Cargill Inc.
50	Kansas Gas & Electric
51	Kansas Gas & Electric
53	Kansas Gas & Electric
54	Garvey Grain
56	SP Wallingford
57	Ross Industries
58	Wichita Flour Mills
64	Ritchie Construction
74	Derby Refining
77	Derby Refining

Table 4.2 POINT SOURCES IN SHAWNEE COUNTY EMITTING 100 TONS OR MORE OF ANY POLLUTANT

Source #	Firm
158	Ismert-Hincke
159	Thompson-Dehydrating
173	Berry Grain
177	Topeka Terminal Elevator
179	Rodney Milling
185	Goodyear Tire and Rubber
187	Concrete Material
189	Kansas Power & Light

5.0 EMISSIONS INVENTORY DATA

Point and area source emissions are summarized by region in Tables 5.1 through 5.7. Data in these tables are based upon information in the point and area source computer printouts.

Figures 5.1 through 5.7 provide a visual summary of the major sources of emission in each AQCR. The pollutant source categories are the same as those used in Tables 5.1 through 5.7 with the exception of the "Other Mobile" category. "Other Mobile" includes emissions from all transportation activities listed in Section IV of Tables 5.1 through 5.7, except gasoline powered vehicles. Emissions from gasoline powered vehciles are shown as a separate category, where significant. Note that the category called "commercial" includes emissions resulting from commercial, institutional and industrial fuel combustion.

The computer printouts are bound separately as point source and area source listings. Point sources within each political jurisdiction (i.e. county) are listed alphabetically for all of the political jurisdictions in each region.

The area source listings contain two types of summaries. In the first, the "county summary," region totals are apportioned to the individual counties within the region. The second type, the "grid summary," is used only for those counties which were "gridded," namely, Leavenworth, Johnson, Wyandotte, Sedgwick, and Shawnee. Here, the county totals were further apportioned to the individual grids.

In the area source printout, emissions from several types of sources are listed under the category "Additional Emissions." The following table is the correspondence between the column number in the printout and the emission source category.

Column Number	Emission Source Category
1	Automotive and diesel emissions if not listed under the appropriate computer calculated column
4	Barge traffic
5	Airport operations
6	Railroads if not listed under computer calculated column
15	Agricultural burning

Table 5.1

EMISSIONS INVENTORY SUMMARY

For the State of Kansas

Kansas Portion of the Kansas City Interstate Air Quality Control Region

Data Representative of Calendar Year 1970

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel-Area Source							
1. Coal	84	619	185	44	19	7407	Tons
2. Distillate Oil	23	89	11	7	28	4599	KGAL
3. Natural Gas	225	7	237	95	890	23725	MMCF
4. Wood							
5. Other							
6. TOTAL	332	715	433	146	937		
B. Comm.-Instl. & Industrial							
1.a Bituminous Coal-Area Source	5191	7306	741	194	519	87399	Tons
b Bituminous Coal-Pt. Source							
2. Coke							
3.a Distillate Oil-Area Source	67	174	1	13	269	8945	KGAL
b Distillate Oil-Pt. Source	16	42	0	3	63	238	KGAL
4.a Residual Oil-Area Source	63	517		8	163	5423	KGAL
b Residual Oil-Pt. Source	99	571	0	14	259	8611	KGAL
5.a Natural Gas-Area Source	67	2	40	82	438	7240	MMCF
b Natural Gas-Pt. Source	166	3	31	322	1464	18353	MMCF
6. Process Gas-Pt. Source							
7.a Other-Area Source							
b Other-Pt. Source							
8. TOTAL	5669	8615	813	636	3175		

Table 5.1 (cont'd)

EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Steam-Electric Power Plant							
1. Anthracite Coal							
2. Bituminous Coal	505	17125	133	40	6709	265100	Tons
3. Distillate Oil							
4. Residual Oil							
5. Natural Gas	58	4	3	277	1949	13874	MMCF
6. Other							
7. TOTAL	563	17129	136	317	8658		
D. TOTAL FUEL COMBUSTION	6564	26459	1382	1099	12770		
II. PROCESS LOSSES							
A. Point Sources	20117	660	1303	6623	936		
B. Area Sources				1631			
III. SOLID WASTE DISPOSAL							
A. Incineration							
1.a On Site-Area Source	508	109	725	218	218	145005	Tons
1.b On Site-Point Source							
B. Open Burning							
1.a On Site-Area Source	401	25	2130	752	150	50106	Tons
1.b On Site-Point Source							
2.a Dumps-Area Source							
2.b Dumps-Point Source	856	37	1411	1201	117	55100	Tons
C. TOTAL SOLID WASTE DISPOSAL	1765	171	4266	2171	485	250211	Tons
IV. TRANSPORTATION-AREA SOURCE							
A. Motor Vehicles-Gasoline	622	377	196978	32346	18661	1884960	KVEHMI
Motor Vehicles-Diesel	890	1601	11565	2313	12099	71169	KGAL
B. Off Highway Fuel Usage							

Table 5.1 (cont'd)

EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Aircraft	469	481	8818	1626	199		
D. Railroad	1331	3461	3728	2663	3994	106500	KGAL
E. Vessels	7	48	18	14	20	560	KGAL
P. Gasoline Hndlg. Evap. Losses				3041			
G. Other							
H. TOTAL TRANSPORTATION	3319	5968	221107	42003	34973		
V. MISCELLANEOUS-AREA SOURCES							
A. Agricultural Burning							
B. Solvent				2759			
C. TOTAL MISCELLANEOUS				2759			
VI. GRAND TOTAL							
A. AREA SOURCE	9948	14816	225177	47806	37667		
B. POINT SOURCE	21817	18442	2881	8480	11497		
C. TOTAL	31765	33258	228058	56286	49164		

Table 5.2

EMISSIONS INVENTORY SUMMARY

For the State of Kansas

Northeast Intrastate Air Quality Control Region

Data Representative of Calendar Year 1970

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel-Area Source							
1. Coal	155	1145	343	82	34	13700	Tons
2. Distillate Oil	47	181	23	14	56	9300	KGAL
3. Natural Gas	141	4	149	60	558	14881	MMCF
4. Wood							
5. Other							
6. TOTAL	343	1330	515	156	648		
B. Comm.-Instl. & Industrial							
1.a Bituminous Coal-Area Source	442	735	117	29	43	8784	Tons
b Bituminous Coal-Pt. Source							
2. Coke							
3.a Distillate Oil-Area Source	28	71		6	109	3618	KGAL
b Distillate Oil-Pt. Source	13	25	0	3	51	1690	KGAL
4.a Residual Oil-Area Source	54	453		7	142	4746	KGAL
b Residual Oil-Pt. Source	28	220	0	3	84	2577	KGAL
5.a Natural Gas-Area Source	307	10	9	550	2563	33755	MMCF
b Natural Gas-Pt. Source	171	5	24	346	1558	19682	MMCF
6. Process Gas-Pt. Source							
7.a Other-Area Source							
b Other-Pt. Source							
8. TOTAL	1043	1519	150	944	4550		

Table 5.2 (cont'd)

EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Steam-Electric Power Plant							
1. Anthracite Coal							
2. Bituminous Coal	925	5057	68	21	1231	136743	Tons
3. Distillate Oil	8	12	0	1	23	864	KGAL
4. Residual Oil	5	84	0	4	63	1180	KGAL
5. Natural Gas	305	10	7	719	7029	35904	MMCF
6. Other							
7. TOTAL	1243	5163	75	745	8346		
D. TOTAL FUEL COMBUSTION	2629	8012	740	1845	13544		
II. PROCESS LOSSES							
A. Point Sources	14970	0	3	45	25		
B. Area Sources				2271			
III. SOLID WASTE DISPOSAL							
A. Incineration							
1.a On Site-Area Source	516	110	737	221	221	147300	Tons
1.b On Site-Point Source	11	0	11	2	0	1910	Tons
B. Open Burning							
1.a On Site-Area Source	989	62	5253	1854	371	123595	Tons
1.b On Site-Point Source							
2.a Dumps-Area Source							
2.b Dumps-Point Source	951	61	5040	1780	355	118829	Tons
C. TOTAL SOLID WASTE DISPOSAL	2467	233	11041	3857	947	272805	Tons
IV. TRANSPORTATION-AREA SOURCE							
A. Motor Vehicles-Gasoline	693	420	153330	28474	23608	2098901	KVEHMI
Motor Vehicles-Diesel	188	339	2446	489	2559	15053	KGAL
B. Off Highway Fuel Usage							

Table 5.2 (cont'd)

EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Aircraft	579	179	7163	1907	231		
D. Railroad	211	548	591	422	633	16874	KGAL
E. Vessels							
P. Gasoline Hndlg. Evap. Losses				1962			
G. Other							
H. TOTAL TRANSPORTATION	1671	1485	163530	33254	27031		
V. MISCELLANEOUS-AREA SOURCES							
A. Agricultural Burning	285		1668	303	31		
B. Solvent				1616			
C. TOTAL MISCELLANEOUS	285		1668	1919	31		
VI. GRAND TOTAL							
A. AREA SOURCE	4635	4256	171829	40267	31159		
B. POINT SOURCE	17387	5474	5153	2924	10419		
C. TOTAL	22022	9730	176982	43191	41578		

Table 5.3

EMISSIONS INVENTORY SUMMARY

For the State of Kansas

North Central Intrastate Air Quality Control Region

Data Representative of Calendar Year 1970

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel-Area Source							
1. Coal	79	583	174	42	17	6970	Tons
2. Distillate Oil	27	104	13	8	32	5369	KGAL
3. Natural Gas	117	4	123	49	462	12315	MMCF
4. Wood							
5. Other							
6. TOTAL	223	691	310	99	511		
B. Comm.-Instl. & Industrial							
1.a Bituminous Coal-Area Source	226	474	106	26	22	5673	Tons
b Bituminous Coal-Pt. Source	0	0	0	0	0	4	Tons
2. Coke							
3.a Distillate Oil-Area Source	23	59	0	4	90	3020	KGAL
b Distillate Oil-Pt. Source	2	3	0	0	8	248	KGAL
4.a Residual Oil-Area Source	19	156	0	2	49	1626	KGAL
b Residual Oil-Pt. Source	0	6	0	0	2	85	KGAL
5.a Natural Gas-Area Source	195	6	76	308	1496	21262	MMCF
b Natural Gas-Pt. Source	119	4	2	265	1175	13287	MMCF
6. Process Gas-Pt. Source							
7.a Other-Area Source							
b Other-Pt. Source	59	1	0	93	662		
8. TOTAL	643	709	184	698	3504		

Table 5.3 (cont'd)

EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Steam-Electric Power Plant							
1. Anthracite Coal							
2. Bituminous Coal							
3. Distillate Oil	6	11	0	0	24	897	KGAL
4. Residual Oil	5	54	0	2	25	648	KGAL
5. Natural Gas	35	2	0	85	775	4438	MMCF
6. Other							
7. TOTAL	46	67	0	87	824		
D. TOTAL FUEL COMBUSTION	912	1467	494	884	4839		
II. PROCESS LOSSES							
A. Point Sources	18393	6422	7	1836	243		
B. Area Sources				2004			
III. SOLID WASTE DISPOSAL							
A. Incineration							
1.a On Site-Area Source							
1.b On Site-Point Source							
B. Open Burning							
1.a On Site-Area Source							
1.b On Site-Point Source	1170	73	6098	2193	438	146216	Tons
2.a Dumps-Area Source							
2.b Dumps-Point Source	532	33	2943	998	200	66525	Tons
C. TOTAL SOLID WASTE DISPOSAL	1702	106	9041	3191	638		
IV. TRANSPORTATION-AREA SOURCE							
A. Motor Vehicles-Gasoline	520	315	111507	20962	17873	1575400	KVEHMI
Motor Vehicles-Diesel	176	317	2289	458	2394	14085	KGAL
B. Off Highway Fuel Usage							

Table 5.3 (cont'd)

EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Aircraft	297	90	3538	965	119		
D. Railroad	107	278	299	213	320	8539	KGAL
E. Vessels							
F. Gasoline Hndlg. Evap. Losses				1405			
G. Other							
H. TOTAL TRANSPORTATION	1100	1000	117633	24003	20706		
V. MISCELLANEOUS-AREA SOURCES							
A. Agricultural Burning	255	0	1490	300	30		
B. Solvent				711			
C. TOTAL MISCELLANEOUS	255	0	1490	1011	30		
VI. GRAND TOTAL							
A. AREA SOURCE	3211	2459	125713	29650	23342		
B. POINT SOURCE	19151	6536	2952	3279	3114		
C. TOTAL	22362	8995	128665	32929	26456		

Table 5.4

EMISSIONS INVENTORY SUMMARY

For the State of Kansas

Northwest Intrastate Air Quality Control Region

Data Representative of Calendar Year 1970

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel-Area Source							
1. Coal	45	334	100	24	10	4000	Tons
2. Distillate Oil	17	67	9	5	21	3441	KGAL
3. Natural Gas	77	2	81	32	303	8093	MMCF
4. Wood							
5. Other							
6. TOTAL	139	403	190	61	334		
B. Comm.-Instl. & Industrial							
1.a Bituminous Coal-Area Source	141	347	92	22	13	4153	Tons
b Bituminous Coal-Pt. Source							
2. Coke							
3.a Distillate Oil-Area Source	19	48	0	4	73	2505	KGAL
b Distillate Oil-Pt. Source	0	0	0	0	0	12	KGAL
4.a Residual Oil-Area Source	7	54	0	1	17	572	KGAL
b Residual Oil-Pt. Source	4	28	0	1	10	346	KGAL
5.a Natural Gas-Area Source	153	5	65	232	1140	16639	MMCF
b Natural Gas-Pt. Source	19	0	0	46	231	2379	MMCF
6. Process Gas-Pt. Source							
7.a Other-Area Source							
b Other-Pt. Source	60	1	0	87	665		
8. TOTAL	403	483	157	393	2149		

Table 5.4 (cont'd)

EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Steam-Electric Power Plant							
1. Anthracite Coal							
2. Bituminous Coal							
3. Distillate Oil	34	57	0	7	132	4501	KGAL
4. Residual Oil	2	47	0	1	30	586	KGAL
5. Natural Gas	123	4	2	325	3050	16299	MMCF
6. Other							
7. TOTAL	159	108	2	333	3212		
D. TOTAL FUEL COMBUSTION	701	994	349	787	5695		
II. PROCESS LOSSES							
A. Point Sources	2563	0	4	2	0		
B. Area Sources				1594			
III. SOLID WASTE DISPOSAL							
A. Incineration							
1.a On Site-Area Source							
1.b On Site-Point Source							
B. Open Burning							
1.a On Site-Area Source	602	38	3197	1128	226	75227	Tons
1.b On Site-Point Source							
2.a Dumps-Area Source							
2.b Dumps-Point Source	718	45	3819	1348	269	89862	Tons
C. TOTAL SOLID WASTE DISPOSAL	1320	83	7016	2476	495		
IV. TRANSPORTATION-AREA SOURCE							
A. Motor Vehicles-Gasoline	415	251	83740	16465	14347	1157500	KVEHMI
Motor Vehicles-Diesel	180	325	2346	469	2455	14439	KGAL
B. Off Highway Fuel Usage							

Table 5.4 (cont'd)

EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Aircraft	18	3	6	9	15		
D. Railroad	69	180	194	139	208	5550	KGAL
E. Vessels							
F. Gasoline Hndlg. Evap. Losses				987			
G. Other							
H. TOTAL TRANSPORTATION	682	759	86286	18069	17025		
V. MISCELLANEOUS-AREA SOURCES							
A. Agricultural Burning							
B. Solvent				416			
C. TOTAL MISCELLANEOUS				416			
VI. GRAND TOTAL							
A. AREA SOURCE	1743	1654	89830	21527	18828		
B. POINT SOURCE	3523	182	3825	1817	4387		
C. TOTAL	5266	1836	93655	23344	23215		

Table 5.5

EMISSIONS INVENTORY SUMMARY

For the State of Kansas

Southeast Intrastate Air Quality Control Region

Data Representative of Calendar Year 1970

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel-Area Source							
1. Coal	314	2325	695	167	70	27806	Tons
2. Distillate Oil	15	58	7	4	18	2971	KGAL
3. Natural Gas	125	4	131	53	492	13132	MMCF
4. Wood							
5. Other							
6. TOTAL	454	2387	833	224	580		
B. Comm.-Instl. & Industrial							
1.a Bituminous Coal-Area Source	392	623	90	23	39	7449	Tons
b Bituminous Coal-Pt. Source	394	318	6	1	81	5400	Tons
2. Coke							
3.a Distillate Oil-Area Source	21	56	0	1	86	2859	KGAL
b Distillate Oil-Pt. Source	2	0	0	0	6	227	KGAL
4.a Residual Oil-Area Source	51	425	0	7	134	4462	KGAL
b Residual Oil-Pt. Source	30	215	0	4	85	2710	KGAL
5.a Natural Gas-Area Source	190	6	62	322	1529	20866	MMCF
b Natural Gas-Pt. Source	89	3	1	200	905	9974	MMCF
6. Process Gas-Pt. Source							
7.a Other-Area Source							
b Other-Pt. Source	37	0	0	55	105		
8. TOTAL	1206	1646	159	613	2885		

Table 5.5 (cont'd)

EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Steam-Electric Power Plant							
1. Anthracite Coal							
2. Bituminous Coal	291	1272	11	3	320	21600	Tons
3. Distillate Oil	2	3	0	0	8	271	KGAL
4. Residual Oil	6	82	0	5	78	1506	KGAL
5. Natural Gas	81	3	2	243	2274	11676	MMCF
6. Other	3	0	0	0	0		
7. TOTAL	383	1360	13	242	2680		
D. TOTAL FUEL COMBUSTION	2043	5393	1005	1079	6145		
II. PROCESS LOSSES							
A. Point Sources	76086	0	49	60	60		
B. Area Sources				2633			
III. SOLID WASTE DISPOSAL							
A. Incineration							
1.a On Site-Area Source							
1.b On Site-Point Source							
B. Open Burning							
1.a On Site-Area Source	891	56	4734	1671	334	111392	Tons
1.b On Site-Point Source							
2.a Dumps-Area Source							
2.b Dumps-Point Source	964	60	5122	1808	362	120473	Tons
C. TOTAL SOLID WASTE DISPOSAL	1855	116	9856	3497	698		
IV. TRANSPORTATION-AREA SOURCE							
A. Motor Vehicles-Gasoline	549	333	116652	22023	18954	1665900	KVEHMI
Motor Vehicles-Diesel	171	308	2223	445	2326	13682	KGAL
B. Off Highway Fuel Usage							

Table 5.5 (cont'd)

EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Aircraft	22	23	621	91	10		
D. Railroad							
E. Vessels	155	402	433	309	464	12363	KGAL
F. Gasoline Hndlg. Evap. Losses							
G. Other				1334			
H. TOTAL TRANSPORTATION	897	1066	119929	24202	21754		
V. MISCELLANEOUS-AREA SOURCES							
A. Agricultural Burning	465	0	2714	544	56		
B. Solvent				2242			
C. TOTAL MISCELLANEOUS	465	0	2714	2786	56		
VI. GRAND TOTAL							
A. AREA SOURCE	3361	4619	128362	31869	24512		
B. POINT SOURCE	77985	1956	5191	2370	4284		
C. TOTAL	81346	6575	133553	34239	28796		

Table 5.6

EMISSIONS INVENTORY SUMMARY

For the State of Kansas

South Central Intrastate Air Quality Control Region

Data Representative of Calendar Year 1970

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel-Area Source							
1. Coal	50	369	110	26	11	4415	Tons
2. Distillate Oil	20	76	10	6	23	3902	KGAL
3. Natural Gas	124	4	130	52	489	13049	MMCF
4. Wood							
5. Other							
6. TOTAL	194	449	250	84	523		
B. Comm.-Instl. & Industrial							
1.a Bituminous Coal-Area Source	1321	1970	241	62	132	23564	Tons
b Bituminous Coal-Pt. Source							
2. Coke							
3.a Distillate Oil-Area Source	61	158	1	12	243	8112	KGAL
b Distillate Oil-Pt. Source	33	90	0	7	133	4451	KGAL
4.a Residual Oil-Area Source	442	1534	2	24	482	16079	KGAL
b Residual Oil-Pt. Source	30	208	0	3	80	2684	KGAL
5.a Natural Gas-Area Source	658	22	168	1192	5528	72177	MMCF
b Natural Gas-Pt. Source	212	7	93	323	1592	32084	MMCF
6. Process Gas-Pt. Source							
7.a Other-Area Source							
b Other-Pt. Source	22	0	0	48	349		
8. TOTAL	2779	3989	505	1671	8539		

Table 5.6 (cont'd)

EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Steam-Electric Power Plant							
1. Anthracite Coal							
2. Bituminous Coal							
3. Distillate Oil	28	70	0	5	109	3649	KGAL
4. Residual Oil	6	125	0	4	82	1581	KGAL
5. Natural Gas	531	21	14	1414	13667	71641	KGAL
6. Other	7	0	0	19	188		
7. TOTAL	572	216	14	1442	14046		
D. TOTAL FUEL COMBUSTION	3545	4654	769	3197	23108		
II. PROCESS LOSSES							
A. Point Sources	15000	993	1128	664	9114		
B. Area Sources				4616			
III. SOLID WASTE DISPOSAL							
A. Incineration							
1.a On Site-Area Source	1445	310	2065	619	619	412996	Tons
1.b On Site-Point Source							
B. Open Burning							
1.a On Site-Area Source	1046	65	5559	1962	392	130810	Tons
1.b On Site-Point Source							
2.a Dumps-Area Source							
2.b Dumps-Point Source	1186	74	6300	2275	445	149450	Tons
C. TOTAL SOLID WASTE DISPOSAL	3677	449	13924	4856	1456		
IV. TRANSPORTATION-AREA SOURCE							
A. Motor Vehicles-Gasoline	1040	630	245688	44513	34763	3150000	KVEHMI
Motor Vehicles-Diesel	290	522	3770	754	3944	23200	KGAL
B. Off Highway Fuel Usage							

Table 5.6 (cont'd)

EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Aircraft	1275	394	12882	3868	537		
D. Railroad	253	658	709	506	760	20256	KGAL
E. Vessels							
F. Gasoline Hndlg. Evap. Losses				3080			
G. Other							
H. TOTAL TRANSPORTATION	2858	2204	263049	52720	40004		
V. MISCELLANEOUS-AREA SOURCES							
A. Agricultural Burning	255	0	1488	298	30		
B. Solvent				4596			
C. TOTAL MISCELLANEOUS	255	0	1488	4894	30		
VI. GRAND TOTAL							
A. AREA SOURCE	8280	6712	272573	66185	47953		
B. POINT SOURCE	17055	1588	7535	4762	25759		
C. TOTAL	25335	8300	280108	70947	73712		

Table 5.7

EMISSIONS INVENTORY SUMMARY

For the State of Kansas

Southwest Intrastate Air Quality Control Region

Data Representative of Calendar Year 1970

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel-Area Source							
1. Coal	24	176	53	13	5	2105	Tons
2. Distillate Oil	25	99	13	8	31	5091	KGAL
3. Natural Gas	74	2	78	31	292	7798	MMCF
4. Wood							
5. Other							
6. TOTAL	123	277	144	52	328		
B. Comm.-Instl. & Industrial							
1.a Bituminous Coal-Area Source	171	366	84	21	16	4377	Tons
b Bituminous Coal-Pt. Source							
2. Coke							
3.a Distillate Oil-Area Source	18	46	0	3	71	2374	KGAL
b Distillate Oil-Pt. Source	1	1	0	0	3	98	KGAL
4.a Residual Oil-Area Source	13	110	0	2	35	1163	KGAL
b Residual Oil-Pt. Source							
5.a Natural Gas-Area Source	163	6	60	264	1268	17807	MMCF
b Natural Gas-Pt. Source	39	0	0	87	378	4316	MMCF
6. Process Gas-Pt. Source							
7.a Other-Area Source							
b Other-Pt. Source	181	7	0	286	1987		
8. TOTAL	569	536	144	663	3758		

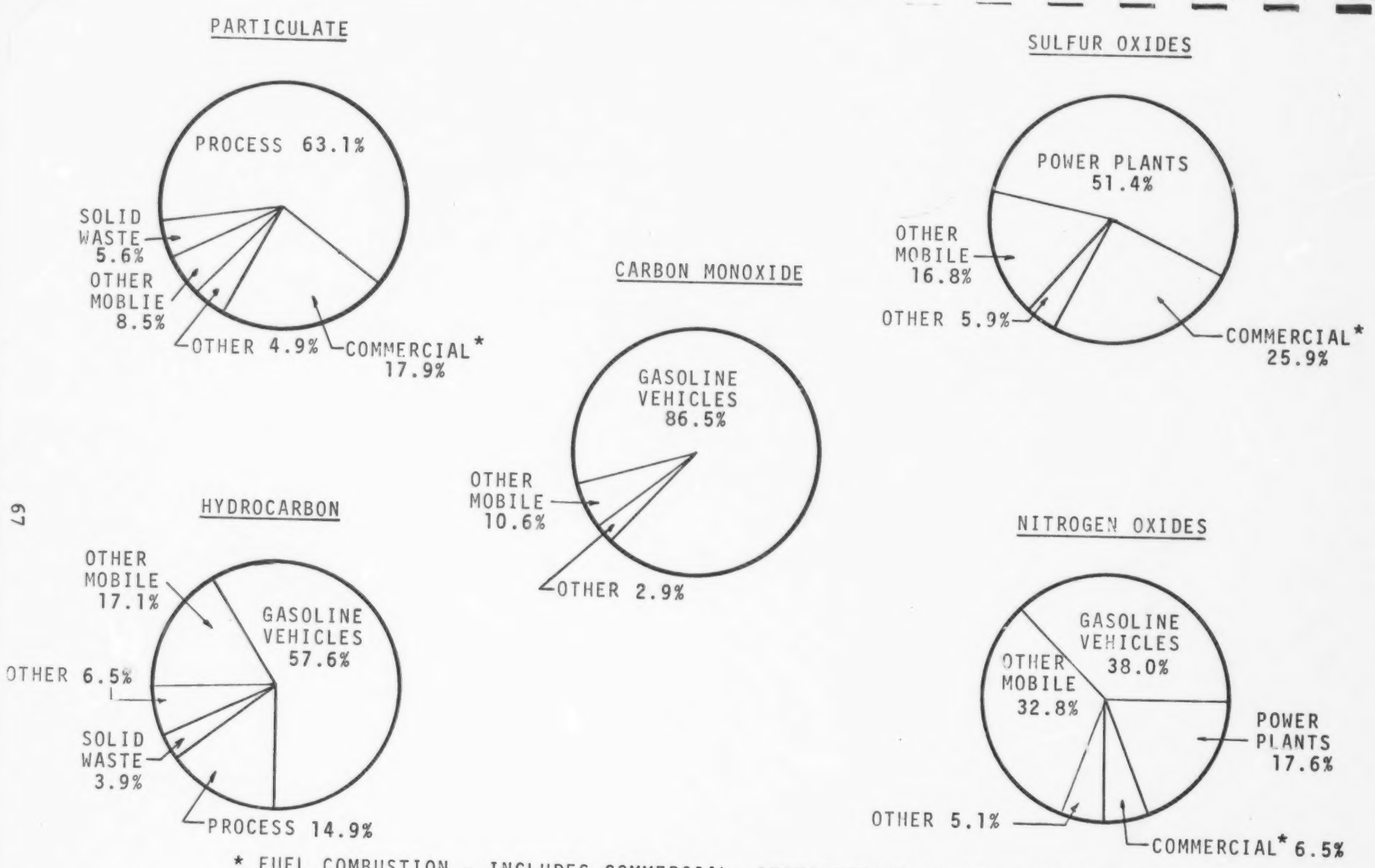
EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Steam-Electric Power Plant							
1. Anthracite Coal							
2. Bituminous Coal							
3. Distillate Oil	8	13	0	0	32	1060	KGAL
4. Residual Oil	1	25	0	1	17	319	KGAL
5. Natural Gas	131	4	3	330	2660	16454	MMCF
6. Other							
7. TOTAL	140	42	3	331	2709		
D. TOTAL FUEL COMBUSTION	831	855	291	1046	6795		
II. PROCESS LOSSES							
A. Point Sources	4952	0	596	10069	8		
B. Area Sources				1756			
III. SOLID WASTE DISPOSAL							
A. Incineration							
1.a On Site-Area Source							
1.b On Site-Point Source	359	36	1076	359	90	35880	Tons
B. Open Burning							
1.a On Site-Area Source							
1.b On Site-Point Source	724	45	3844	1357	271	90443	Tons
2.a Dumps-Area Source							
2.b Dumps-Point Source	784	18	1509	532	107	35426	Tons
C. TOTAL SOLID WASTE DISPOSAL	1867	99	6429	2248	468	90443	Tons
IV. TRANSPORTATION-AREA SOURCE							
A. Motor Vehicles-Gasoline	522	316	110472	20880	18016	1582300	KVEHMI
Motor Vehicles-Diesel	176	317	2293	459	2398	14108	KGAL
B. Off Highway Fuel Usage							

Table 5.7 (cont'd)

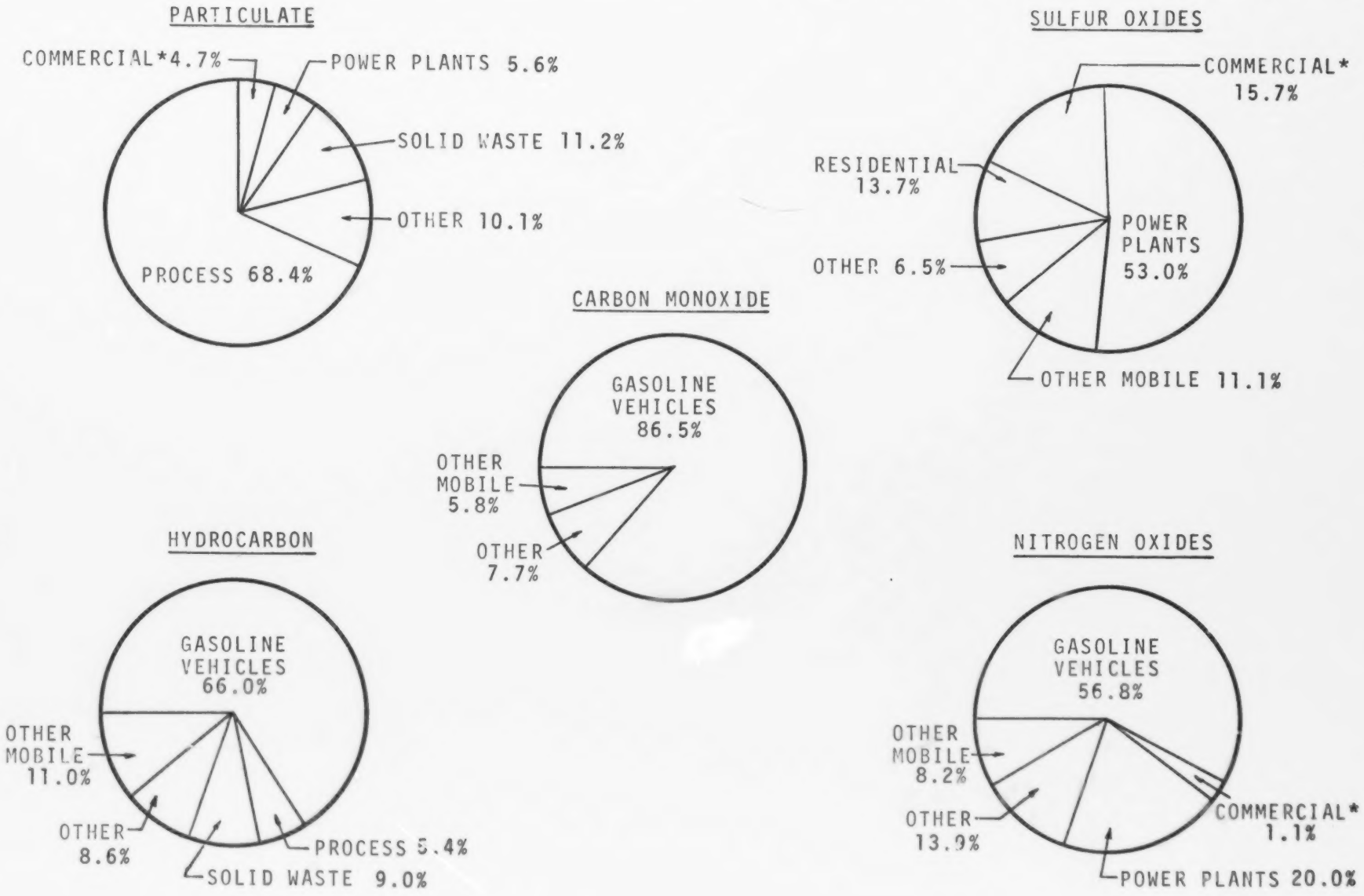
EMISSIONS INVENTORY SUMMARY

SOURCE CATEGORY	Tons of Pollutant/Year					Fuel, etc.	
	Part.	SO_2	CO	HC	NO_x	Quantity	Units
C. Aircraft	35	44	1495	184	13		
D. Railroad	82	214	230	165	247	6581	KGAL
E. Vessels							
P. Gasoline Hndlg. Evap. Losses				1418			
G. Other							
H. TOTAL TRANSPORTATION	815	891	114490	23106	20674		
V. MISCELLANEOUS-AREA SOURCES							
A. Agricultural Burning							
B. Solvent				423			
C. TOTAL MISCELLANEOUS				423			
VI. GRAND TOTAL							
A. AREA SOURCE	2027	1741	118322	26984	22663		
B. POINT SOURCE	6456	104	3184	11664	5282		
C. TOTAL	8483	1845	121506	38648	27945		



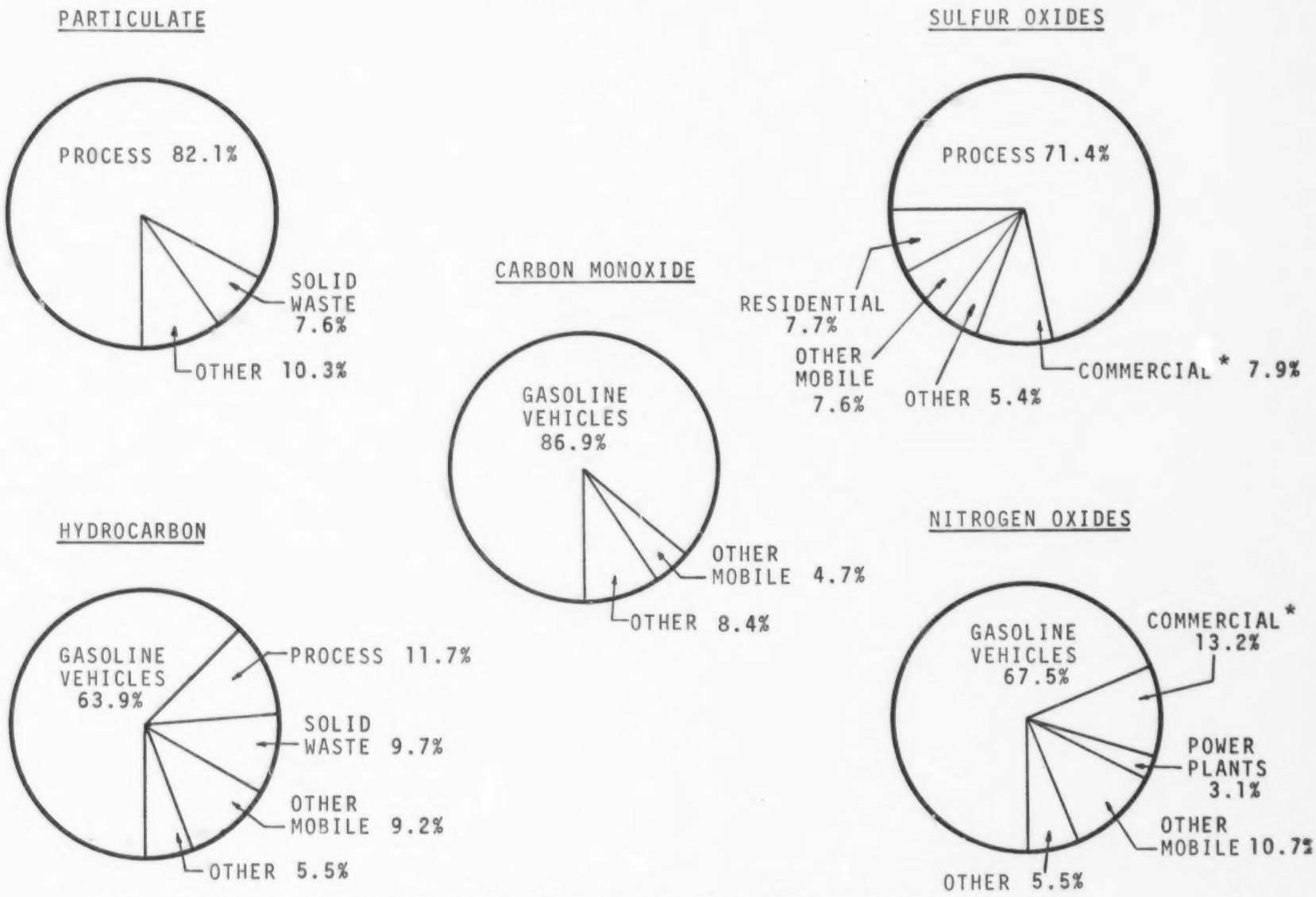
* FUEL COMBUSTION - INCLUDES COMMERCIAL, INSTITUTIONAL & INDUSTRIAL FUEL

FIGURE 5.1 POLLUTANTS EMITTED BY PRINCIPAL SOURCES - KANSAS PORTION OF THE METROPOLITAN KANSAS CITY INTERSTATE AIR QUALITY CONTROL REGION



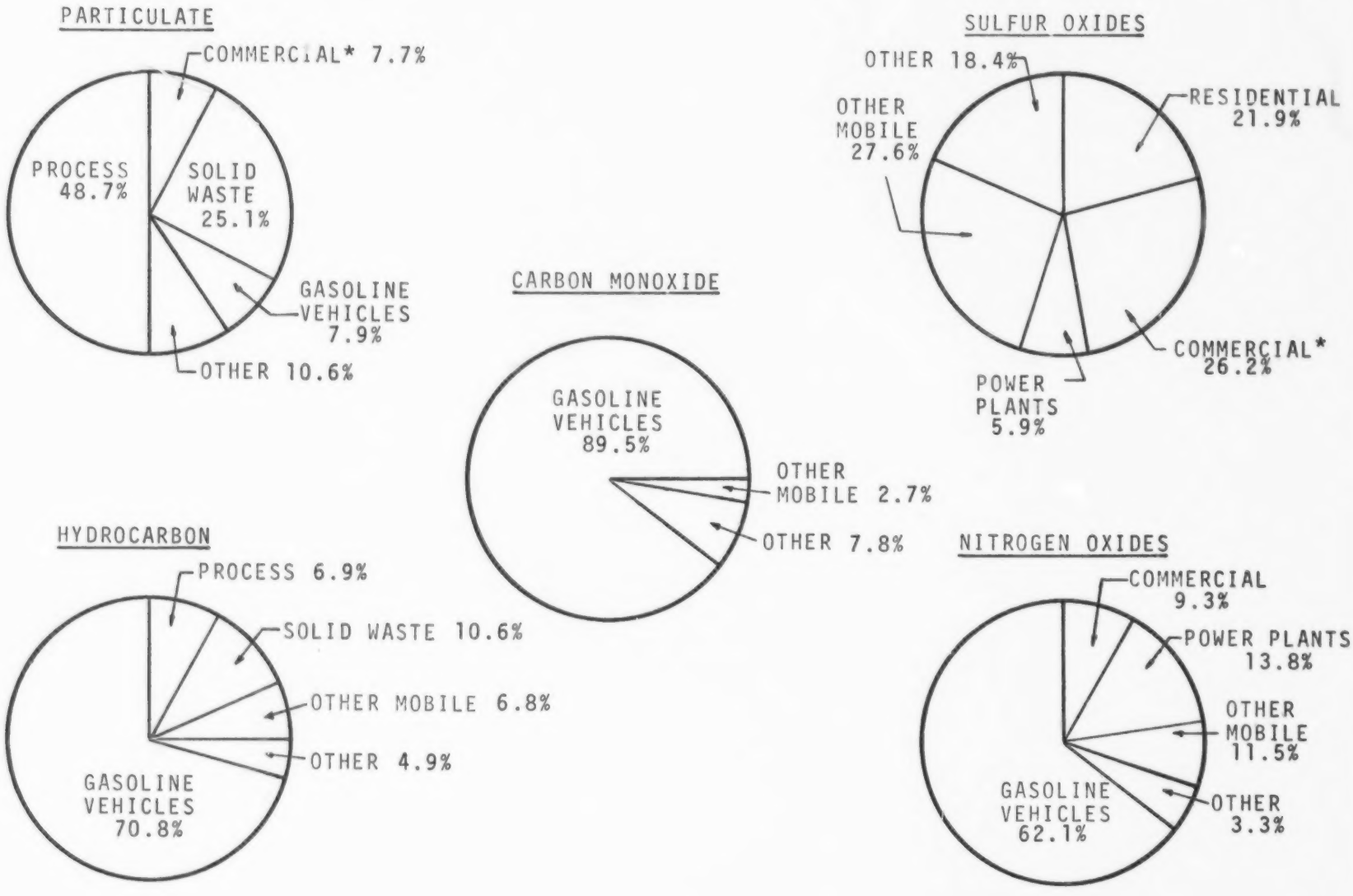
* FUEL COMBUSTION - INCLUDES COMMERCIAL, INSTITUTIONAL & INDUSTRIAL FUEL

FIGURE 5.2 POLLUTANTS EMITTED BY PRINCIPAL SOURCES - NORTHEAST KANSAS INTRASTATE AIR QUALITY CONTROL REGION



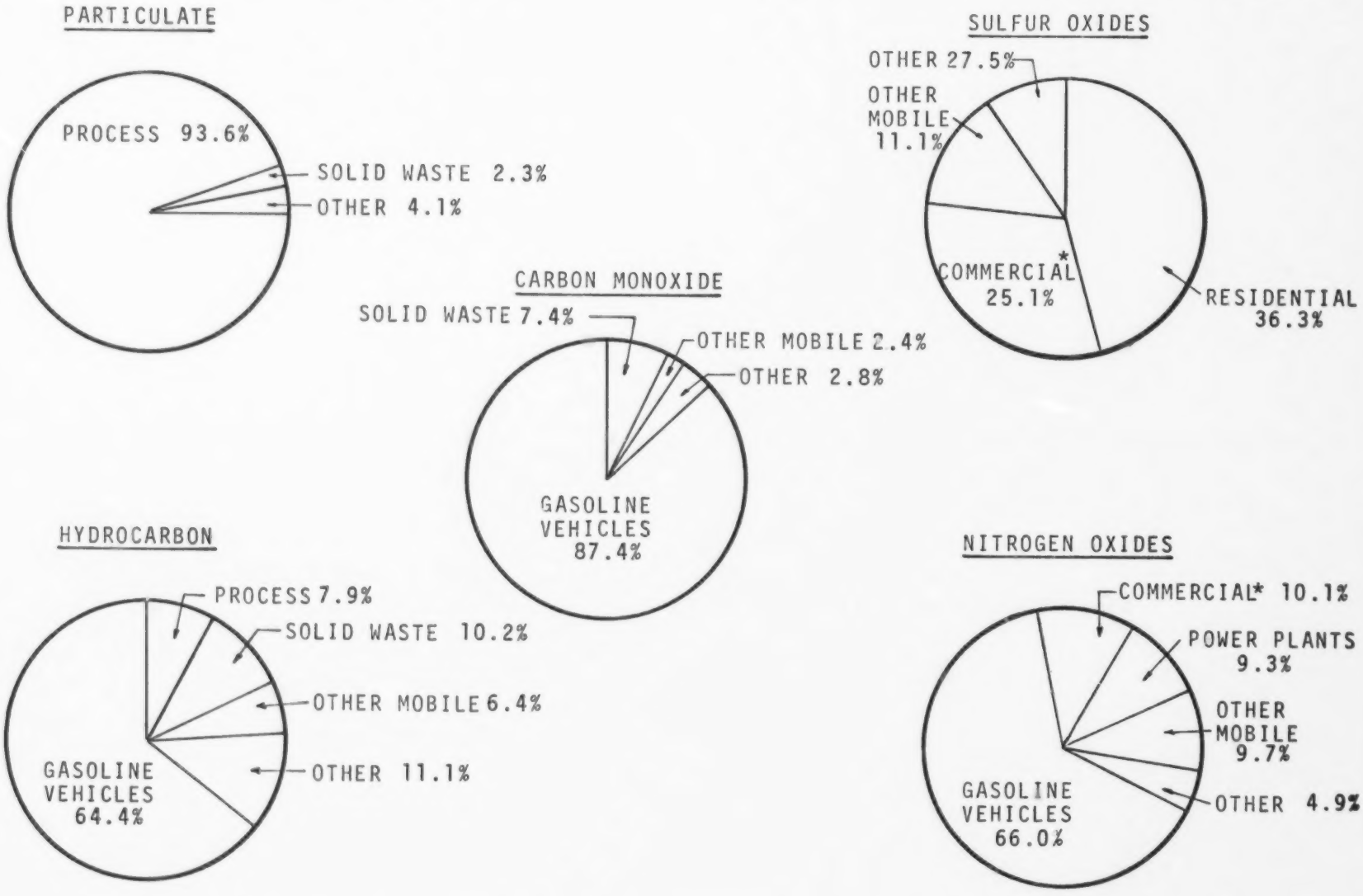
* FUEL COMBUSTION - INCLUDES COMMERCIAL, INSTITUTIONAL & INDUSTRIAL FUEL

FIGURE 5.3 POLLUTANTS EMITTED BY PRINCIPAL SOURCES - NORTH CENTRAL KANSAS INTRASTATE AIR QUALITY CONTROL REGION



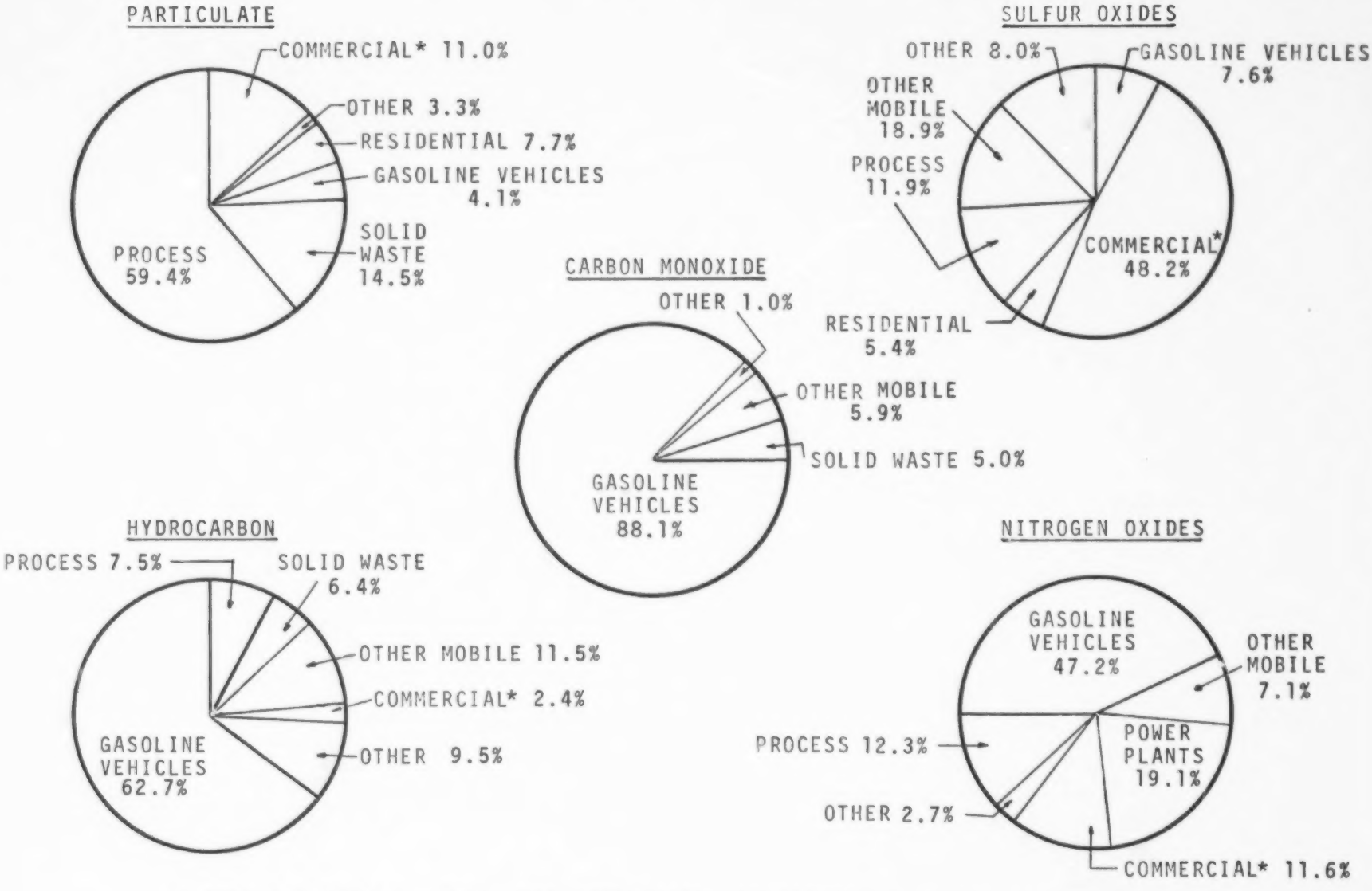
* FUEL COMBUSTION - INCLUDES COMMERCIAL, INSTITUTIONAL & INDUSTRIAL FUEL

FIGURE 5.4 POLLUTANTS EMITTED BY PRINCIPAL SOURCES - NORTHWEST KANSAS INTRASTATE AIR QUALITY CONTROL REGION



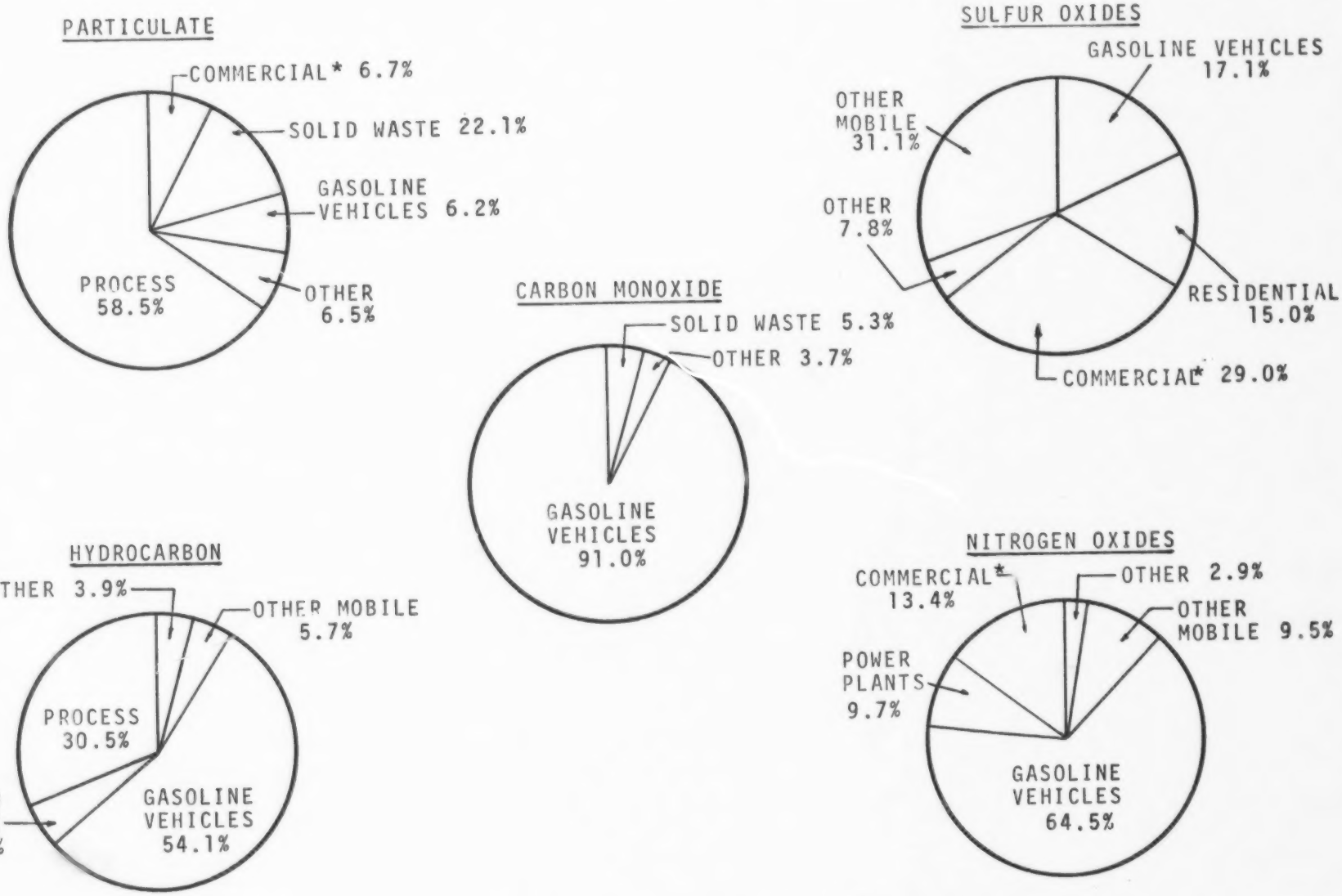
* FUEL COMBUSTION - INCLUDES COMMERCIAL, INSTITUTIONAL & INDUSTRIAL FUEL

FIGURE 5.5 POLLUTANTS EMITTED BY PRINCIPAL SOURCES - SOUTHEAST KANSAS INTRASTATE AIR QUALITY CONTROL REGION



* FUEL COMBUSTION - INCLUDES COMMERCIAL, INSTITUTIONAL & INDUSTRIAL FUEL

FIGURE 5.6 POLLUTANTS EMITTED BY PRINCIPAL SOURCES - SOUTH CENTRAL KANSAS INTRASTATE AIR QUALITY CONTROL REGION



* FUEL COMBUSTION - INCLUDES COMMERCIAL, INSTITUTIONAL & INDUSTRIAL FUEL

FIGURE 5.7 POLLUTANTS EMITTED BY PRINCIPAL SOURCES - SOUTHWEST KANSAS INTRASTATE AIR QUALITY CONTROL REGION

6.0 APPENDICES

6.1 Appendix A

The emission factor set numbers and the corresponding emission factors are listed in Tables 6.1 and 6.2 respectively.

TABLE 6.1 EMISSION FACTOR SET NUMBERS USED IN COMPUTER CALCULATED EMISSIONS FROM POINT SOURCE FUEL COMBUSTION

Set Number	Source Type	
	-Bituminous Coal Boilers-	
01	General Pulverized	>100 x 10^6 BTU/Hr.
02	Wet Bottom Pulverized	>100 x 10^6 BTU/Hr.
03	Dry Bottom Pulverized	>100 x 10^6 BTU/Hr.
04	Cyclone	>100 x 10^6 BTU/Hr.
05	Stoker (Large commercial and general industrial)	10-100 x 10^6 BTU/Hr.
06	All other Stokers	10-100 x 10^6 BTU/Hr.
07	Stoker (Domestic and Commercial)	<10 x 10^6 BTU/Hr
08	Handfired	<10 x 10^6 BTU/Hr.
	-Anthracite Coal Boilers-	
09	Pulverized Dry Bottom	
10	Overfeed Stokers	
11	Handfired	
	-Fuel Oil Boilers-	
12	Power Plant-Residual	
13	Industrial and Commercial--Residual	
14	Industrial and Commercial--Distillate	
15	Domestic--Distillate	
	-Natural Gas Boilers-	
16	Power Plant	
17	Industrial	
18	Domestic Commercial	
19	Gas Turbines	
20	Gas Engines	

TABLE 6.2 EMISSION FACTOR

EMISSION FACTOR SET #	PARTICULATE	SO_2	CO	HYDROCARBON	NO_2	UNITS
1	16.000A	38.000S	1.000	0.300	18.000	Pounds per ton of coal burned
2	13.000A	38.000S	1.000	0.300	30.000	"
3	17.000A	38.000S	1.000	0.300	18.000	"
4	2.000A	38.000S	1.000	3.000	55.000	"
5	13.000A	38.000S	2.000	1.000	15.000	"
6	5.000A	38.000S	2.000	1.000	15.000	"
7	2.000A	38.000S	10.000	3.000	6.000	"
8	2.000A	38.000S	90.000	20.000	3.000	"
9	17.000A	38.000S	1.000	0.030	18.000	"
10	2.000	38.000S	5.000	0.200	10.000	"
11	1.000	38.000S	90.000	2.500	3.000	"
12	8.000	159.000S	0.040	5.000	105.000	Pounds per thousand gals. of oil burned
13	23.000	159.000S	0.200	3.000	60.000	"
14	15.000	144.000S	0.200	3.000	60.000	"
15	10.000	144.000S	0.500	3.000	12.000	"
16	15.000	0.600	0.400	40.000	390.000	Pounds per million cu. ft. of gas burne
17	18.000	0.600	0.400	40.000	175.000	"
18	19.000	0.600	20.000	8.000	75.000	"
19	15.000	0.600	0.400	40.000	200.000	"
20	15.000	0.600	0.400	40.000	7300.000	"

A = Ash content of coal in percent.

S = Sulfur content of fuel in percent.

Example: For a wet bottom pulverized coal fired boiler burning a 3% sulfur content coal, 114 pounds of SO_2 (38 x 3) would be emitted per ton of coal burned.

6.2 Appendix B

Table 6.3 is an example of the source emission report required by the Kansas Department of Health for all sources on a reporting schedule. Table 6.4 is an example of the additional reports required of specified industries.

TABLE 6.3 KANSAS STATE DEPARTMENT OF HEALTH

Source Emission Report (Particulate)

General Processing

Firm Name (Operator) _____

Mailing Address _____

Installation Location _____

Products Manufactured or Handled _____

_____

Sources of particulate discharges exceeding one pound per hour

(excluding refuse disposal and indirect heating)

Description of individual source operations* which emit particulate matter (use supplemental sheets as necessary).

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

*Defined as the last operation preceeding the emission of particulate matter, which results in the separation of particulate matter from the processed materials or the conversion of the processed materials into the particulate emissions (prior to control devices).

Nature of particulate discharges (by source number - use supplemental sheets as necessary).

a. Source No. _____

b. Chemical and Physical Nature of Particulate _____

c. Rate of Discharge (pounds per hour) Maximum _____ Average _____

d. Is operation a continuous, batch or cyclical operation? _____

e. Duration and daily frequency of batch or cyclic operations _____

f. Normal operating schedule _____ hours/day, from _____ to _____;

_____ days/week. Days per year (If seasonal) _____ .

g. Point of discharge to atmosphere: Ht. _____ Stack diameter _____

h. Is source operation existing _____ or proposed _____ ?

i. Has source operation been added or modified since January 1, 1971? _____

TABLE 6.3

Nature of all material input into process (by source number - use supplemental sheets as necessary).

Source No. _____

Material (a) _____ Physical state _____ ; lb/hr _____

(b) _____ Physical state _____ ; lb/hr _____

(c) _____ Physical state _____ ; lb/hr _____

Primary Fuels (Direct Heating): Type _____ ; amount burned/hr _____

Alternate Fuels (Direct Heating): Type _____ ; amount burned/hr _____

Primary Control Devices (by source number - use supplemental sheets as necessary).

Source No. _____

Manufacturer _____ Type _____ Model _____

Volume of Gas Handled _____ CFM Inlet Gas Temp. _____ ° F.

Inlet Dust Rate _____ lb/hr Outlet Dust Rate _____ lb/hr

Collection Efficiency _____ %

Method of Disposal of Collected Materials _____

Secondary Control Devices (by source number - use supplemental sheets as necessary).

Source No. _____

Manufacturer _____ Type _____ Model _____

Volume of Gas Handled _____ CFM Inlet Gas Temp. _____ ° F.

Inlet Dust Rate _____ lb/hr Outlet Dust Rate _____ lb/hr

Collection Efficiency _____ %

Method of Disposal of Collected Materials _____

If Control Devices are wet scrubbers:

Water Flow Rate _____ gal/min. Pressure _____ psi

Method of waste water disposal _____

If Control Devices are combustion units:

Temperature _____ °F. Fuel Type _____ Hourly Fuel combustion rate _____

TABLE 6.3

Indirect Heating Units

(list individual units - use supplemental sheets as necessary)

a. Unit No. _____ Use: Process Heat _____ Space Heat _____

b. Heat Media: Air _____ Steam _____ Water _____ Other _____

c. Maximum Heating Capacity: Design _____ BTU/hr Operating _____ BTU/hr

d. Primary Fuel: Natural gas _____, Oil _____ Coal _____
Other (Specify) _____ Average amount burned/hr _____
Max. amount burned/hr _____ Normal operating schedule: _____
hours/day from _____ to _____ ; _____ days/year

e. Alternate Fuels: Natural gas _____ Oil _____ Coal _____
Other (Specify) _____ Estimated amount burned annually _____

f. If oil is burned, indicate: Grade _____ % Sulfur _____

g. If coal is burned, indicate: % Ash _____ % Sulfur _____

h. Is unit equipped with an air pollution control device? _____
If yes, describe: _____
_____
_____

i. Is unit existing _____ or proposed _____ ?

j. Has unit been added or modified since January 1, 1971? _____

Refuse Disposal

a. Type of Waste _____

b. Amount of Waste _____ tons/year

c. Method of Disposal: By owner/operator _____ By Contract _____

If disposed of by operator/owner is waste disposed of by:

Incinerator _____ Open Burning _____ Covered Landfill _____

Open Dump _____

If disposed of by contractor: Name of firm _____

TABLE 6.3

Other Sources of Particulate Emissions

Are there any other sources of particulate emissions associated with storage, transfer and/or transport of materials, or other use of the premises? _____
If yes, describe briefly: _____

This is to certify that the above information is true and complete to the best of my knowledge.

Signature _____ Title _____ Date _____

Return completed form to:

Kansas State Department of Health
Division of Environmental Health
Air Quality and Occupational Health Section
State Office Building
Topeka, Kansas 66612

TABLE 6.4 KANSAS STATE DEPARTMENT OF HEALTH

Source Emission Report - Steam Generating Electric Power Plant

Firm Name (Operator) _____

Mailing Address _____

Installation Location _____

Fuel Burning Equipment Data

Boiler Number	Year Installed	Maximum Rated Capacity				Type(s)* Fuel	Burner Type(s)**	Generator Rating (1000 KW)	Control*** Devices
		BTU/hr	Steam Output 1000#/hr	PSIG	°F				

*Indicate as: C (Coal), G (Gas), O plus No. (Oil Grade)
**Indicate by number and letter subscript where applicable

I Underfeed
II Traveling grate or spreader stoker
III Cyclone furnace
IV Pulverized: w(wet bottom), d(dry bottom), i(fly ash reinjection)
V Oil Burner: r(rotary) g(gun type)
VI Gas
VII Other (Specify) _____

***H-Hoppers, M-Mechanical, S-Wet Scrubber, P-Precipitator, F-Fabric Filter, O-Other. (To be described in more detail on page 4).

TABLE 6.4 Fuel Data (Most recent actual 12 mos. use)

Indicate: From _____ to _____

Type* Fuel	Sulfur** % Ave.	Ash** % Ave.	Heat Content** BTU per ____	Consumption per Hour		Annual*** Consumption
				Average	Maximum	

*With oils, include number

**If unknown, give name and address of fuel supplier

***Indicate as 10^6 CF (gas), 1000 gallons (oil) or tons (coal)

Were units operated on fuel other than gas except during periods of actual gas curtailment?

Yes _____ No _____

If yes, indicate unit numbers, annual amount, and type of fuel used during periods other than actual curtailment periods.

_____

_____

_____

_____

_____

_____

TABLE 6.4 Fuel Data (Estimate for next 12 mos.)

Indicate: From _____ to _____

Type* Fuel	Sulfur** % Ave.	Ash** % Ave.	Heat Content** BTU per ___	Consumption per Hour		Annual*** Consumption
				Average	Maximum	

*With oils, include number
**If unknown, give name and address of fuel supplier
***Indicate as 10^6 CF (gas), 1000 gallons (oil) or tons (coal)

re units intended to be operated on fuel other than gas except during periods of actual gas curtailment? Yes _____ No _____

l yes, indicate unit numbers, amount and type of fuel anticipated to be used during periods other than actual curtailment periods _____

_____

_____

_____

_____

Stack Data

tack lumber	Height Feet	Inside Diameter at top, Feet	Maximum Heat Input, BTU/hr	Exit Gas		Boilers Served No.
				Temp. F	Vel. FPS	

TABLE 6.4 Emission and Pollution Control Data

Primary Control Devices (by stack number - use supplemental sheets as necessary).

Stack No. _____

Manufacturer _____ Type _____ Model _____

Volume of Gas Handled _____ CFM Inlet Gas Temp. _____ F

Inlet Dust Rate _____ lb/hr Outlet Dust Rate _____ lb/hr

Collection Efficiency _____ %

Method of Disposal of Collected Materials _____

Secondary Control Devices (by stack number - use supplemental sheets as necessary).

Stack No. _____

Manufacturer _____ Type _____ Model _____

Volume of Gas Handled _____ CFM Inlet Gas Temp. _____ F

Inlet Dust Rate _____ lb/hr Outlet Dust Rate _____ lb/hr

Collection Efficiency _____ %

Method of Disposal of Collected Materials _____

If control devices are wet scrubbers:

Water Flow Rate _____ gal/min Pressure _____ psi

Method of waste water disposal _____

This is to certify that the above information is true and complete to the best of my knowledge.

Signature _____ Title _____ Date _____

Return complete form to:

Kansas State Department of Health
Division of Environmental Health
Air Quality and Occupational Health Section
State Office Building
Topeka, Kansas 66612